



Published on the 15th of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 114 TRIBUNE BUILDING, NEW YORK, U. S. A.

JNO. R. DUNLAP.

H. C. PEARSON.

Vol. 3.

OCTOBER 15, 1890.

No. 1.

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and Canada. Foreign countries, \$3.50. Special Rates for Clubs of five, ten or more subscribers.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft, Post Office Orders or Express Money orders on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Post order, payable as above.

Trade supplied by the American News Co. and all its branches.

Entered at New York Post Office as second-class matter.

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THE subscription price of the INDIA RUBBER WORLD has been fixed at \$3 a year, on account of the constant expansion of the size and scope of the paper which circumstances seem to demand.

Opening of the Fall Trade in Rubber Clothing.

IT is pretty generally understood that the rubber clothing trade is one of those lines of business in which there is either a feast or a famine. Through the summer time with many of the manufacturers it has been an absolute famine. Many mills have been shut down, and the few that ran were not taxed to the extent of their capacity. It was, however, with the firm faith that the fall trade would open up favorably that the rubber men endured this season of drouth, and that their belief is justified is seen by the way orders are now coming in. Within the last few weeks there has been a most marked change in the attitude of buyers of rubber clothing. Orders have been coming in rapidly, and as a rule, they are large orders, and the prices are fair. Goods this fall are particularly well finished and the coatings are fully as good as they have been. Indeed, there is a marked improvement in the appearance and texture of rubber clothing from whatever manufacturer it may come. The Mackintosh is still growing in popularity. As one manufacturer said: "The Mackintosh is a garment where a man gets some pay for individual genius." In other words, the old-fashioned black rubber coat, whether made by an artist in garment making, or by an ordinary workman, was about the same in result. The Mackintosh, however, is a garment in which the genius for the selection of material, the faculty for having it made up in the most attractive style, and all of the skill and experience of the veteran cloak or coat-maker, can be utilized. This garment, therefore, grows more and more popular, both with manufacturer and consumer, for the former can put a price upon it which will pay for the expenditure of thought and care, and the latter is perfectly willing to pay for the results that are attained.

The Death of Lineman Kopp.

ON September 30 last an inquest was held to inquire into the cause of the death of August Kopp, who was killed while at work on an electric light pole at the corner of Thirty-fifth Street and Broadway, in New York, on the night of the fifteenth of the month. The coroner's jury, composed principally of electrical men, brought in a verdict to the effect that Kopp would not have lost his life had he exercised proper care (*i.e.*, had he been wearing at the time the rubber gloves provided by the company), and further, that "while said August Kopp did not exercise proper care, it has appeared in evidence that the defective insulation which existed at the various arc lamps was a necessary factor in causing his death; and that the existence of such defective insulation was countenanced by the Board of Electrical Control. It is the opinion of this jury that the operation of high-tension electric circuits in such condition is a dangerous practice."

For a proper understanding of this verdict it is necessary to review the evidence given at the inquest, by which the exact manner in which Kopp met his death and the various contributing causes were made clear. It appears that Kopp, who was a patrolman in the employ of the

United States Illuminating Co., was inspecting the working of the lamps in a certain district on the night in question, and observing that the lamp at Thirty-fifth Street and Broadway was extinguished, he climbed the pole to remove the cause of trouble, although he had left his rubber gloves at the Central station. Kopp, therefore, did not "exercise proper care," and directly violated the rules of the company which provide that all employes shall wear rubber gloves when working on live circuits. It is a matter of history that he paid the penalty of his excess of zeal with his life, but exactly how this came about has not been correctly stated in any published report of the accident.

It appears from the evidence that the circuit was grounded on the lamp frame through a defective insulator and Kopp's idea was to remove the ground from the circuit by cutting out the lamp. He effected this by baring a small portion of the insulated wires by which the lamp was connected to the cables and joining them across by means of a "jumper"—a short, thick piece of wire heavily insulated and provided with a clamp at either end for making the connections. Having thus cut out the lamp, he proceeded to disconnect the wires from the lamp terminals, and endeavored to twist them together in order that he might remove the jumper. In making the attempt, he touched one of the bare ends and thereby received the shock that resulted in his death.

It would appear to most persons that, having fixed the "jumper" properly and so completed the circuit, Kopp ought to have been able to handle the free ends without receiving any hurt, as they then only represented one side of the circuit. His death having been produced in this way shows that the circuit must have been grounded at some other point, or at least that the total insulation of the circuit was so low that it practically amounted to a ground; Kopp, clinging to the iron pole and lamp support, made a second ground, and he naturally received a powerful shock.

The circuit consisted of about $4\frac{1}{2}$ miles of under-ground cable, $1\frac{1}{2}$ miles of over-head wire and 48 arc lamps, and according to the evidence of the self-satisfied gentleman who poses as expert to the Board of Electrical Control, the insulation of the entire circuit, measured *in fine weather*, was about 1.6 megohms. This result was obtained some days before the accident and some days after, but no test was made on the day of the accident or on the day following. Wet weather prevailed about that time, and it had never occurred either to the expert or to the superintendent of the company to have a test made in wet weather, and the latter official could only guess at the probable insulation of the circuit under such conditions, placing it at about half a megohm. This was a very liberal estimate, about a fiftieth part of that figure would probably be nearer the mark. The point is that the company did not know and the "expert" to the Board did not know how low the insulation fell, or, in other words, whether the circuit was safe or dangerous in wet weather, and apparently they did not care to know; they could only say that under the best conditions the insulation of the circuit was fairly good.

The experience of lineman Kopp showed that in wet weather to touch one side only of the circuit meant death, and the company owe it to their good luck that the man had infringed their rules in not carrying his rubber gloves, as even though he had had them the wire might have touched some other part of his body, say his neck or face, in which case he would have been killed just the same.

The evidence given on behalf of the company shed some light on a lamentable method or rather want of method in testing circuits and keeping records of tests made. It is with some surprise that we learn of an important company, like the one in question, clinging to the antiquated magneto bell test—a test which means nothing at all, as the witness for the company could not even say what resistance the bell would ring through, the deduction being that it would only show whether the circuit was dead grounded or not. The insulation might fall dangerously low, but the magneto would give no sign.

The main point to be borne in mind in connection with this peculiar case is that Kopp was killed because the insulation of the circuit was so low as practically to amount to a "ground." The witness for the company accounted for this low insulation by crediting it to the accumulation of leakage from the arc lamps, the frames of which form part of the circuit. This explanation probably accounts for a great deal of the leakage, and the rest would no doubt be made up among the over-head wires and poorly insulated connections between lamps and cables.

The fact remains, however, that the insulation of such a circuit falls dangerously low in wet weather, and we fully concur in the verdict of the jury characterizing the operation of high-tension circuits in such condition as a dangerous practice. It remains for the electric light companies to find the remedy, and it would clearly seem to be the duty of the Board of Electrical Control to insist upon some remedy being applied. If the present construction of arc lamps is such that they afford escapes for the current in wet weather, it ought to be no very difficult matter to improve the construction so as to eliminate this dangerous defect. A vast amount of work has been done in the production of efficient arc lamps, surely our industrious inventors might now turn their attention to the design of one that shall be safe.

We sympathize with the electric light companies to a certain extent for the persecution they underwent last winter, but at the same time we have an idea that they are rather inclined to carry things with a high hand where they have the chance; now that it has been clearly shown that the first element to be considered in the operation of high-tension currents, namely, insulation, is disregarded to the extent of rendering the operation of their circuits a "dangerous practice," we think that the sooner they are compelled to adopt improvements in their methods of construction the better it will be for all parties concerned.

THE publishers will be glad to pay 20 cents each for copies of the December, 1889, and February, 1890, numbers of the INDIA RUBBER WORLD in order to supply a pressing demand.

A Government Report on Rubber.

THE Government at Washington has forwarded instructions to its Consuls throughout the world to prepare special reports relative to the India rubber interest, whether it relates to the commerce in crude rubber or to the manufacture and sale of the finished product, the questions to be covered by this investigation having been suggested by the INDIA RUBBER WORLD. The gentleman in charge of this work in the Department of State expresses the opinion that the result will be the most interesting of any special inquiry ever set on foot by the Department. Necessarily some time must elapse before the Consuls can all be heard from, but the readers of this paper may depend upon having the full benefit of whatever is brought out by the investigation, in advance of any other publication.

INDIA-RUBBER CIRCULAR.

DEPARTMENT OF STATE,
WASHINGTON, September 20, 1890. }

To the Consular Officers of the United States:

GENTLEMEN:—The editor of the INDIA RUBBER WORLD, a journal published in New York, has requested the Department to secure, through your good offices, information concerning India rubber and the manufactures thereof. The information desired resolves itself into two divisions, viz.:

First. That portion of the subject relating to caoutchouc, or India rubber, in its crude condition.

Second. The manufactures of India rubber.

While that portion of the subject which relates to raw material is necessarily confined to a few consulates, it is of primary importance, for the reason that, while the manufactures of India rubber are steadily increasing, there would seem to be no effort made for the conservation of the rubber forests. This destruction of the rubber tree is beginning to be the cause of uneasiness to our manufacturers for very potent reasons, and the special attention of Consuls in the rubber districts is invited hereto, and they are requested to spare no pains in their efforts to secure as full and satisfactory information as possible upon this point. It is hardly necessary to say that full and satisfactory answers are always expected from consular officers whenever the Department considers it necessary to call upon them for information, and special attention is only called to the supply of crude rubber simply because it is a phase of the subject which might not strike Consuls as being of primary importance.

The answers to this circular will be published in special form, and it is expected that the publication will cover every point of interest in the great industry under consideration, enabling our importers to be fully informed as to the supply of the crude rubber and our manufacturers to extend their trade in the markets of the world.

The attention of Consuls is again called to the rule which requires that reports intended for publication should

be separate and distinct from the transmitting dispatches, and written on one side of the paper only.

I am, gentlemen, your obedient servant,

WILLIAM F. WHARTON,
Acting Secretary.

CAOUTCHOUC, OR INDIA RUBBER.

1. Is caoutchouc, or India rubber, a product of your district?
2. Mention whether it is yielded by trees or by vines, and, where possible, procure botanical names.
3. Describe the method of conducting the business of rubber gathering and the processes employed by the gatherers.
4. Is any American capital employed in rubber gathering or rubber trading in the district?
5. Name the amounts of crude rubber exported from the district, and the countries to which it is consigned.
6. Mention whether there is an export duty; and, if so give the rate and the amount of annual revenue from it.
7. Is there any fear expressed of the failure or early decrease of the natural supply of rubber?
8. Have any experiments been made in the cultivation of rubber trees, plants, or vines?
9. If so, recount the successes or failures.
10. Is it believed that rubber is susceptible of cultivation, or that its culture would be profitable?

MANUFACTURES OF INDIA RUBBER.

11. If India rubber enters into the manufactures of your district, report fully upon the character and extent of the goods produced, specifying rubber clothing, boots and shoes, hose, belting, and other classes of goods made of rubber.
12. To what extent and to what countries are these goods exported?
13. Forward price-lists of representative manufacturers, where obtainable.
14. Is the crude rubber used imported free or subject to duty?
15. Report the extent of the importation of manufactures of rubber in your district, specifying the countries of their origin, as far as possible.
16. Give, especially, the amount and value of rubber goods imported from the United States, specifying where possible rubber clothing, boots and shoes, etc.
17. Mention whether duties are imposed upon foreign manufactures of rubber.
18. How are American rubber goods regarded in comparison with those from other countries?
19. What suggestions would you offer for the benefit of American rubber manufacturers desirous of extending their trade into your district?

A PARÁ journal presages a great future for the Jauapery river district as a rubber producing zone. Only the fear of the Indians prevents the gatherers going into this district, which is said to be rich in fish and turtle, and produces not only rubber, but copaiba gum and oil.—*Rio News*.

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The Hodgman Rubber Stores.

SO far back as when the manufacture of India rubber was a curiosity to nine-tenths of the people of the United States, the Hodgman Rubber Co. were laying the foundation of what has become a prosperous and influential corporation. When the manufacture of rubber was first mooted in this country, and the mills were naturally very small, and so obscure as to have left almost no historical record, Daniel Hodgman, father of Mr. George F. Hodgman, now president of the company, went to Massachusetts, and obtained employment. This was about the year 1820, and he remained in that section until about 1830, when he came to New York. At first he located in a small basement in Cedar Street. He associated with himself a partner named Hoyt, but the union was not a successful one, and the firm met with reverses.

Mr. Hodgman was next to be found in another store on the corner of Maiden Lane and Nassau Street, where success began to reward his efforts. A few relics are brought down from this time. One is a small pass-book, home made, with entries of transactions made in it, and with covers formed from a copy of the New York Sun, which bears a date in 1839. Some advertising cards were published in that day, which in a quaint, old-fashioned way, said that, among other articles, mackintoshes were for sale. This was not long after the efforts of the celebrated foreigner whose name these garments bear, had begun to manufacture "Macintoshes," as they were spelled in England then, and it plainly illustrates a spirit of enterprise, which in those days was always ready to enter into any undertaking at once, that had obtained a foothold in the Old World, and oftentimes before it had hardly passed the experimental stage abroad. The old stand on the corner of Maiden Lane and Nassau Street was retained for a long time, it being afterward exchanged for more commodious quarters at No. 425 Broadway, and again to Nos. 459-461 Broadway, the present location, the founder of the firm having died in the meantime, leaving the business to his sons. A corporation was formed in 1886, the company now being managed by the descendants of the original founder.

The first Hodgman factory was established in 1840, at the foot of Twenty-sixth Street, near East River; but in 1853, the present buildings at Tuckahoe, N. Y., were built, to be followed in 1882 by larger facilities at Mount Vernon, N. Y. At that time the Goodyear patents were in force, and in order to soften the gum, camphene was poured on to it in the grinder, a mode of procedure crude in its way, and involving a risk not especially desired by either life, or fire insurance companies. The goods were then sun-cured.

The stores of the Hodgman Rubber Co. are three in number, one on the corner of Broadway and Grand Street, another on West Twenty-third Street, in New York City, and the third on School Street, in Boston, Mass. The store at the corner of

Broadway and Grand Street, in New York City, is one of the largest of its kind, consisting of the main-floor and the basement, with an additional basement under the next store on Broadway. The main floor is well lighted, from the position on two main streets, and is 50x110 feet in dimensions. It is well fitted for the display of goods, show cases and counters, extending across the breadth, and has handsome suite of offices. A large display of mackintoshes and clothing, air goods, druggists' sundries, and all the miscellaneous articles found in the modern rubber store are found on this floor. Everything is conveniently and handsomely arranged, and an excellent effect is produced in the mind of the purchaser at every step he may take in supplying all needs in this line.

Mackintoshes of all styles and patterns are to be found here. An elegant garment in the style of a driving coat, made of a light melton, well lined in plaid, sleeves faced with silk, velvet collar, pearl buttons, elegant enough for any use, which sells for \$75, will serve to illustrate the perfection to which these goods are

brought. In one of the basements 5000 mackintoshes are stored at a time, a stock not unusual with the company, which devotes the entire plant at Mt. Vernon to the manufacture of these serviceable garments. In this factory alone 300 people are employed, so that it can readily be seen that even this large stock is kept in a state of perpetual motion toward the consumer. The factory at Tuckahoe is used for preparing the clothing, for mould work, air goods, specialties, etc.

In air goods, and kindred specialties, the company excel, for besides a certain excellence, the designs in Scotch plaids are in elegant taste, and well calculated to please the eye of the intending purchaser. Elegant toilet companion for brushes, combs, etc., delicately scented, are among a score of articles in which this company takes pride in manufacture. Waterproof lap robes and steamer rugs, substantial in appearance, of an utility when compared with the ordinary article in wool, unapproachable, well made and well designed, are goods only to be

once known to be always afterward used. And so on can the customer go from case to case, and counter to counter, until profusion and excellence become tiresome, and the patron begins to long for something mediocre. Although the store is rarely open at night, 100 incandescent lights help the discriminating customer to judge of colors and effects in dark days and the short afternoons of winter.

The branch stores are, in detail, similar to the main one. That on Twenty-third Street, in New York City, has a floor space of 40x200 feet, is well lighted by electricity and nicely carpeted. A skylight nicely screened in part, or in whole, at will, adds much to the convenience of patrons. This store is in a most desirable location, being adjacent to the Fifth Avenue Hotel, and is in charge of C. H. Flagg, who has spent a score of years in the business—long enough to command an excellent trade for the company he represents.

The store on School Street, Boston, is in a very desirable



HODGMAN RUBBER CO'S STORE
Broadway and Grand Street, New York City.

location, and on a par with each of the others in convenience, taste and adaptation to the trade. This store is in charge of Mr. H. C. Noyes, who has been in the rubber business since boyhood and is well fitted for the responsibilities of his position.

The new factory at Mt. Vernon, N. Y., of which much has been said, is a large structure 30x165 feet, four stories high, and equipped with all the modern machinery now extant for the manufacture of rubber garments. This building replaces a former one destroyed by fire, and has only been in operation a few days.

It will be seen from the foregoing that the interests of the Hodgman Rubber Co. are large and varied, extending to the operation of two large factories, and the management of three stores. Their business ramifies into every important centre, and it is instructive to the business mind to learn the principle forming the undercurrent of success. Probably one factor as much as another—and of course there are several—is well illustrated by turning back into the annals of the first-half of this century, where is to be found a solid silver medal handsomely cut, given to Mr. Hodgman in 1839, by the American Institute of New York, as stated on its obverse side, "for the best specimen of Clothing, Life Preservers, etc." This medal of course is the best evidence that Mr. Hodgman stood at the head of the business of that day; and Mr. George F. Hodgman states that the principle of excellence has been the motto of the firm ever since he took the first lesson in business from his father.

In these days of close competition, and oftentimes apparently ruinous prices of rivals who have sprung up over the land, this principle faithfully carried out has more than once attested its wisdom, and no people take greater pains to keep informed of the quality of goods that are being put upon the market from all quarters, for the purpose of attaining a continual superiority, than the officers of the Hodgman Rubber Co. Of course the handing down of the business through three generations is a weighty factor in success, for it is by such means that a large experience is conserved, true lessons of economy taught and grave errors intently and confidently avoided. The officers of the company are George F. Hodgman, president and treasurer; Charles A. Hodgman, vice-president, and George B. Hodgman, secretary, and it is scarcely necessary to state, that all are gentlemen of high business and social standing.

Gov. English and the Rubber Trust.

THE Potter-Lovell failure, says the *Boot and Shoe Recorder*, calls the circumstance to mind that during the palmy days of the first rubber trust scheme this concern was in the deal, and intended to have floated all of the trust certificates which were to be issued for the consumption of the dear public. This concern also was the concern that was responsible for smashing the first trust scheme. One of its members having taken it upon himself to go down to Connecticut and interview the late Gov. English, who, with his mill, was inclined to stand out against any trust idea. The note broker finding all his reasoning unavailing, finally turned to his last argument and thought he had played a trump when he urged the Governor that it was necessary for him to come into the trust, otherwise certain other mills must fail and disrupt the business of the country. The argument was like shaking a red flag in the bull's face, the Governor courteously told the young man that if he supposed he was going to take his mill into a combination for the sake of saving some wild-cat rubber mill from failing he was entirely mistaken, that his mill was abundantly able to take care of itself, and wished to hear nothing further of the matter.

Current Gleanings.

BY LIGHTNING ARRESTER.

THE Brooklyn bridge is a great supporter of electric wires, and a vast number of cables which would otherwise have to cross the East River under water take this safe and convenient route. Two cables are suspended in a very workmanlike manner from stout iron hooks fixed under the promenade; these are the connecting lines which extend the Atlantic cables of the Commercial Cable Company and Western Union Telegraph Company from their landing-places at Coney Island to the terminal offices in New York City. On the cross-girders below rests a heterogeneous collection of wires and cables of all sorts and sizes, carrying telephone and telegraph currents for various public and private services. Some of these have lately been replaced by heavy lead covered cables similar to those laid underground by the telephone company in New York. These lead covered cables contain fifty pairs of wires each, accommodating a greater number of lines in a more compact space than can be effected with rubber insulated cables, and they possess the additional advantage that the style of insulation used (either cotton and paraffin or paper saturated with resinous compound) is more favorable to telephonic transmission than rubber or similar compounds.

* * *

Five of these cables, each 3700 feet long, have lately been drawn across the big bridge. The cables were each laid in three sections, splices being made at each tower, and in the centre of the span; the cables rest on specially constructed creosoted wood cleats placed on the girders. At each end of the bridge connection will be made with the existing underground cables extending through the subways to the Brooklyn telephone exchange and the Cortlandt Street exchange of the Metropolitan Telephone Company. In this way the trunk lines between the two systems will be entirely in cables, and protected from all risk of interruption from atmospheric causes, increasing the security and regularity of telephonic service between the two cities.

* * *

Probably few people are aware that the Metropolitan Telephone Company is the largest user of underground wires in New York. Five of the exchanges are equipped with underground cables, and all the new work is being done on the underground system, no overhead wires being run out of the exchanges. There are altogether about three hundred cables each containing 100 conductors. The Cortlandt Street Exchange being the largest and in the busiest district, has the greatest number of cables, about one-half of the entire number terminating at this office. The cables of course vary greatly in length as they are run to the midst of a group of subscribers, terminated on a house-top or in a cellar and then extended to the various subscriber's stations by means of separate wires. Some cables are only a few hundred feet long, many are over a mile, the longest being nearly six miles, running from Cortlandt Street to Fifty-ninth Street and Tenth Avenue. The general average is about half a mile, the total length of cable laid down being nearly 150 miles, representing 15,000 miles of conductors.

* * *

Before the Atlantic cable was made a success, and at a point in the undertaking when repeated failure had led many people to believe that it never could be made a success, the great mind of Sir William Thomson was brought to bear on the problem of ocean telegraphy, and he reduced to an exact formula the proportions of conductor and insulating material which a long sub-

marine cable, should contain in order that signalling across such an immense distance might be commercially successful. Something of the same sort has been done for telephony by Mr. W. H. Preece, the chief electrician of the British postal telegraphs. Mr. Preece has evolved a formula giving a limit for the electrical conditions of a line over which telephonic communications can be commercially successful. This formula has been verified closely in cases where a length of submarine cable forms part of the telephone line. Speaking roughly a mile of submarine cable is equivalent to nearly thirty miles of overhead wire in its retarding effect upon telephonic transmission, and from this it can easily be understood that very fine work is needed in constructing a submarine cable for telephonic work. For the telephone circuit shortly to be established between London and Paris, a submarine cable of an entirely new type is to be laid across the Straits of Dover. Careful calculations have been made to determine the exact amount of copper and gutta percha to be used in the core, and the specifications are so rigidly drawn up that a variation of only fifteen-hundredths of an ohm per knot is allowed in the resistance of the conductor. The cable will have four conductors, and will be 21 knots (about 24 statute miles) long.

The Butler Hard Rubber Company, No. 33 Mercer Street, New York, is said to be making great improvements in the manufacture of hard rubber. The company has secured the inventions of Mr. William Kiel, who claims to have effected radical changes in the ordinary methods of making and vulcanizing hard rubber. By means of his processes Mr. Kiel obtains material which is black all through and remains so, besides being more flexible and tough, and consequently less brittle than the usual grades of hard rubber. Among other advantages claimed for the new processes are that they render the rubber more suitable for turning and working generally, and that they effect great economy in the manufacture. With all these promises for the better it is no wonder that the Butler Company has enlarged premises and added improved machinery to the plant.

The subject of the proper insulation of electric wires is attracting much attention at Seattle among the fire insurance men of that place. The members of the New England Insurance Exchange are now on a tour of the country looking into the observance of rules of the board of underwriters, and were lately in St. Paul on their way to the Pacific Coast. Mr. Barton, manager of the exchange, told a Seattle electrical man that the subject of imperfect insulation was being agitated at San Francisco, and that the underwriters would cancel all risks on buildings where the rules in regard to insulation of wires were disregarded. It is good to learn that insurance men are taking such a stand. While there is no doubt that the losses by fire due to electric wires have been largely exaggerated, it is nevertheless true that many electrical contractors and many electric light companies have not yet learnt that the best chance for safety lies in the use of the best insulation obtainable; it is highly necessary for the prosperity of the electric lighting industry that this truth should be driven home to all who still persist in disregarding it.

The National Conduit Manufacturing Company has lately closed a contract for placing underground conduits along the line of the electric street railroad at Buffalo, N. Y. The feeders of the system will be placed underground in these conduits, and this will be the first installation of the kind in the country. Underground construction is undoubtedly the best and

safest method of running electric wires and its application to electric railway work will be watched with interest by the profession.

At the recent convention of the Association of Edison Illuminating Companies, Mr. Van Sickle of Sault Ste. Marie, inquired as to the proper construction of submarine cables for electric light and power work; a short discussion ensued and the secretary was instructed to request Mr. Kennelly, of the Edison laboratory, to prepare a paper on the subject, to be incorporated in the minutes of the meeting. Mr. Kennelly is excellently qualified to prepare the paper in question and will no doubt make an interesting and useful compilation of it. Before he became connected with Mr. Edison, Mr. Kennelly was in the service of the Eastern Telegraph Company as electrician on board one of their cable repairing ships and in this position he acquired much experience of the peculiarities of submarine cables.

The latest thing in insulated wires promises both high insulation and incombustibility. The insulating covering consists of mica which is applied in thin, narrow strips which are strengthened and protected by being wrapped with some other non-conducting material, such as cotton, silk, paper or similar substances. Mica has insulating properties of high degree, but the mechanical difficulties of applying it to covering wire would, from the nature of the case, appear to be prohibitive of any extensive adoption of this method of insulating wires, although perhaps there may be cases where it could be used to advantage if found to preserve a very high insulation for any length of time. Mr. Charles Splitdorf, of New York, is the inventor of the new style of covering wires.

A Chance in Sweden.

GISLAVED, SWEDEN, September 7, 1890.

EDITOR INDIA RUBBER WORLD: I see in your paper that calendermen are advertising for situations. As we are to start a factory in the spring, in the south of Sweden, and are in need of a man thoroughly posted in mill and calender work for the manufacture of rubber boots and shoes, I would be very thankful if you would kindly inform me where to find one, and the wages he would expect. Thanking you in anticipation, yours respectfully,

WM. GISLOW.

Paint for a Vulcanizer.

EDITOR INDIA RUBBER WORLD: Please inform your readers of a good mixture of paint to apply to the inside of a vulcanizer to protect it from the action of the condensed steam united with the sulphur gases and other chemicals. Also to protect it from rust.

[Before replying to this letter the editor took occasion to see a number of prominent paint houses, but found nothing that in his judgment filled the bill. A company, however, that once made paint that stood some remarkable tests in this same line, is the Adamanta Manufacturing Co., of Boston. Whether they are to-day putting this paint upon the market, or not, we do not know, but certain it is that we saw it stand some very severe tests, and that it is, if still manufactured, something that would undoubtedly make the life of a vulcanizer very much longer by protecting it from corrosion and rust.—EDITOR.]

The price of this paper is \$3 per Year.

New Goods in the Market.

TO MANUFACTURERS AND PATENTEES:

It is our aim to embody in this department descriptions and illustrations of all the latest novelties introduced in the market, to the end that jobbers, retailers and buyers of rubber generally may look here for information as to everything new that each month or season brings forth. Manufacturers and patentees are, therefore, most cordially invited to co-operate with us in making the department as complete and attractive as possible—the distinct understanding being that no charge whatsoever, either direct or indirect, will be made for these publications. Our reward will come through giving our readers valuable information; and that will be reward enough if manufacturers but give the information freely and in all cases at the earliest practicable moment.

In forwarding descriptions of new goods, be careful to write on one side of the paper only; be brief, but always write enough to give the buyer a clear idea of the article you offer; give your full address, plainly written; and in all cases send a small illustration or wood cut if you have one.

AN instrument for measuring and regulating the requisite quantity of moisture or so-called humidity of the atmosphere we breathe, so essential to the health and comfort of homes, is called the Polymeter. It is designed also to determine the vapor pressure and temperature. It has proved of good service in technical industries, having been used in cotton mills



and paper and starch factories, and it is suggested by the manufacturers that it might be made useful in rubber factories. The Polymeter, of which a good idea is conveyed by the accompanying illustration, is manufactured by Gall & Lemske, opticians, of New York City, who will be pleased to forward the particulars and prices of their goods to any who may desire them.

—The question of inflating an ordinary rubber football is one that many times has puzzled the boyish mind, and quite often the elders in the family have had to struggle with the problem.

The old-fashioned key through which one blew was an abomination, and was continually getting lost or out of order. Something that is very practical in its line, and that the football players have "caught onto" with great avidity, is the new patent football inflator. This is, in brief, a rubber bulb, having a metal nozzle with an ordinary metal valve in it, and a valve in the side of the bulb. By placing the thumb over the valve in the bulb and compressing it, a jet of air is forced into the football. Then releasing the pressure, the bulb, by its own elasticity, springs into shape and fills itself with air. In this way, by a simple bellows movement, a football can be filled quicker and easier than where the force pump is brought into requisition. Another decided advantage of this method is that the football is always filled with dry air. There is no question but the moisture in the breath with which the ordinary football is often inflated, rots the canvas and makes the ball very much shorter lived. For sale by Wright & Ditson, Boston, Mass.



—The day has come when that common article of household use, the pail, or bucket, is made of almost any material except wood. Indeed, the old-fashioned wooden pail is in danger of becoming obsolete. Of all the score or more of receptacles of this sort that are to be found to-day in the market, none have the peculiar excellencies that are to be found in the Novelty Folding Pail. These pails are made of enamel rubber cloth, coated on both sides, the top and the bottom hoops being supported by jointed-side braces. One of the cuts herewith rep-



resents the pail in shape for use, and the other shows it when closed. It will thus be seen that they can be carried in a folded condition under the seat of a carriage, or a buggy, or in a boat, entirely out of the way, and are always ready when needed. For utility and compactness they cannot be excelled, and already they are very popular in many quarters. For sale by the Good-year India Rubber Glove Manufacturing Co., Nos. 503-505 and 205 Broadway, New York City.

—The exceedingly graphic cut herewith given illustrates one of Bailey's Rubber Shampoo Brushes in use. The strong points claimed for it, and which seem to be justified by the phenomenal sale it is having, are that it eradicates dandruff; that it thoroughly cleanses the scalp and hair of all impurities, leaving both in a clean, healthy condition, simply by using it with pure soap and water. It also causes none of the irritation that is almost sure to come from the finger tips or from a bristles brush. For bathing the neck and face, or washing the children, it is a pronounced success. This shampoo brush is made from a sheet of pure rubber, one side being formed into cylindrical teeth, with a flat end, and the whole being as soft and pliable as a silk handkerchief. Manufactured by C. J. Bailey & Co., Boylston Building, Boylston Street, Boston, Mass.



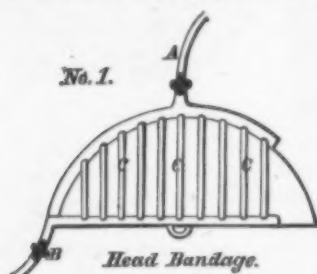
—Among the fall sports that obtain at the colleges and schools throughout the land there is none that has a stronger hold than football. To a casual observer it might not seem

that many of these goods are sold throughout the United States, but the trade in the aggregate is a very large one. Of the largest manufacturers and importers of footballs in this country are Wright & Ditson, and they have done much toward making the game popular. A ball that is



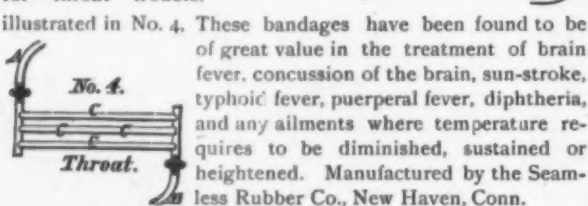
well known among the footballists is the English Rugby Match Football. It is made of a special grade of leather, each section of which is separately dressed in such a way as to be waterproof, and one of its excellencies is that it retains its shape in all weathers. Within the leather casing is a bladder made of Pará rubber. For some time these were imported, but at the present time the American manufacturers are making such excellent goods that the rubber factories in this country have the bulk of the trade in them, so that it comes to pass that by the preference of the players, many times, an imported English football will have an American bladder. For sale by Wright & Ditson, Boston, Mass.

—The treatment of various forms of disease by surface applications of hot and cold water has been found to be exceedingly successful. An adaptation of this idea in which the water in no way comes in contact with the person, but at the same time is made the vehicle by which the heat and cold are applied to the suffering parts, is the Sitwell Bandage, which we herewith illustrate. It is made in four parts, No. 1 being the



head bandage which is so arranged that a continuous stream of hot or cold water can be made to completely encircle the head and flow away, being all the time enclosed in the tubular vessel here shown. No. 2 illustrates the same arrangement for application upon the

abdomen, while No. 3 is to be placed upon the spine. A shorter bandage, but one fully as important, is that for throat trouble,



illustrated in No. 4. These bandages have been found to be of great value in the treatment of brain fever, concussion of the brain, sun-stroke, typhoid fever, puerperal fever, diphtheria, and any ailments where temperature requires to be diminished, sustained or heightened. Manufactured by the Seamless Rubber Co., New Haven, Conn.

Gold Absorbed by Rubber.

THE burnt rubber used for the final polishing off of the gold lettering, etc., used in finer work in the Government Printing Office, is simply India rubber which has been subjected to a peculiar fire process that makes it very spongy and absorbent. So remarkable is its latter quality that a chunk of it as big as three of your fingers will take up more than \$15 worth of gold in its pores. When, after some months of use, such a piece of burnt rubber is loaded with all the gold that it will comfortably carry, it is sent, with a lot of others in the same condition, to the mint to be assayed.—*Washington Star*.

The Craze for English Goods.

THE foolish fad for English goods is illustrated in the case of waterproof goods, called Mackintoshes in England, from Charles McIntosh & Co., the original manufacturers. These goods have been received with great favor in this country and are extensively worn, but it is a mistake to suppose that they cannot be made in America. The fact is that the best and finest silk waterproofs are made in Rhode Island, but on account of the foolishness of American consumers, they have to be sent to London and stamped with an English trade mark, and re-shipped to this country before they can be sold here. It is high time for American manufacturers who are the victims of this fad to assert themselves. One trouble is that Americans, especially women, are ignorant of the quality of American manufactures. They need enlightenment, and a very good way to bring it about is for the manufacturers to advertise their goods. Many of them are doing it, and they are reaping the benefit.—*Springfield, (Mass.) Union, Oct. 7.*

What Encourages Us to Work.

POINT PLEASANT, W. VA., Sept. 29, 1880.

INDIA RUBBER WORLD PUBLISHING CO.:—I really do not think I ever invested a dollar more profitably and with better satisfaction resulting therefrom than the \$1 I sent you for six months' subscription to your valuable, highly pleasing journal. I like it so well that I inclose \$2 for a full year's subscription from the date that my six months run out.

I find your journal very interesting and full of valuable information, suggestions, ideas and other good reading matter, and it just suits me. I think it a good thing for every one in the rubber trade to have. It is one of the best trade "trade" journals I have read.

Yours very truly,

E. A. BURNSIDE, Manager.

DUBUQUE, IOWA, Sept. 26, 1890.

INDIA RUBBER PUBLISHING CO.:—We inclose you New York Draft for \$2 in payment of the WORLD from November, 1890 to November, 1891. We like it very much and can't get along without it.

Very truly yours,

DUBUQUE RUBBER AND BELTING CO.,
per PAUL KIENE, Secretary.

From the "Western Stationer," Chicago.

THE INDIA RUBBER WORLD, published in New York City, recently completed its first volume, and we are pleased to know that the management are well satisfied with its success. It has grown from 44 to 68 pages, and is now the recognized organ of the rubber interest. We count it among our most valued exchanges. It is conducted with ability, and worthy of the liberal patronage it has secured.

From the "Boots and Shoes Weekly," New York.

THE INDIA RUBBER WORLD is one year old. May it live long and prosper!

From the "Shoe and Leather Review," Chicago.

We congratulate THE INDIA RUBBER WORLD, of New York, upon the successful completion of its first year of publication. This journal is an admirable monthly compendium of information pertaining to the important and widely extending rubber industry.

PORTRAITS OF RUBBER MEN—NO. 1.



Nathaniel, Hayward

AFTER AN ENGRAVING BY A. H. RITCHIE.

The Rubber Plants, and the Rubber Yielding Area of Tropical America.

[Written for the INDIA RUBBER WORLD.]

BY COURTENAY DE KALB.

FIRST PAPER.

IN 1851 there were exported from Pará 2,944,000 pounds of rubber in bulk, valued at \$552,000, and 192,000 rubber shoes, which brought \$38,000. In 1868 the value of the rubber exported from Pará is put by Orton at \$1,289,550. The quantity of all grades had increased in 1883 to 11,616,000 pounds, which was further augmented to 14,400,000 pounds in 1885, and in 1888 it reached 17,792,000 pounds. This rapid acceleration in production has been almost entirely in Brazil, and when the small extent of the Amazon Valley which is inhabited is borne in mind, and when it is considered how narrow are the belts of country from which rubber is at present gathered, some notion may be formed of the available area yet to be exploited. There is not a wagon or horse road in any part of this great valley, all the way from Pará to the Andes, except a few of from three to five miles in length, made by the American colonists, who settled at Santarém after the civil war in the United States. The only vehicle in existence is the canoe, the *igareté*, or sail boat, and the steamers which make their monthly rounds. The towns are always, without a single exception, on the margins of the navigable streams. Every *fazenda*, or plantation, is likewise on the river bank. Only the wild tribes live remote in the interior, but even these settle on streams navigable by canoes. The half-civilized, or so-called "Christianized," Indian is quite content to give his savage kinsman ample latitude, in addition to which his natural apathy prevents him from making lengthy excursions into the wilderness. Furthermore, the rubber trees are sufficiently abundant near the larger water-courses to render unnecessary the exploration of the less important streams and *paráns*—the Brazilian name for those infinite little canoe-paths which divide such immense areas of the Amazonian basin into an archipelagic labyrinth. The territory which can at present be exploited is further limited by the cataracts on the rivers from which the rubber comes. Very little is exported from points above these cataracts on account of the great lengths of many of the portages, which not only occasion a loss of time, but frequently a serious damage to the return cargo. On the Rio Tocantins the falls begin 120 miles above Cametá, or only about 300 miles from Pará. Beyond this point are other long reaches of navigable water on the same river, and on its noble tributary, the Araguaya, interrupted at two places by cascades. Although embarrassed by these obstacles to free navigation, the intermediary portions must before many years see steamers plying them for the sake of the rich resources of Grão Pará, of Goyaz, and of Matto Grosso to which they afford access. Castelnau says of this river, that, from the great falls to its junction with the Tocantins, it is a mile in width, and has a current of only three-fourths of a mile per hour. The Rio Xingú is only navigable 150 miles. Here is the first cataract of Juruá, above which are some considerable stretches of navigable water, but the river soon strikes into a mountainous district, becoming as useless as our own Potomac above Georgetown. The Tapajós is obstructed by a cascade 160 miles southwest of Santarém, but it then flows through a wide, deep channel for over 200 miles before other rapids are encountered. Next comes the Madeira, stretching away to the southward 480 miles before reaching the rim of the great basin. The Purús, Juruá, Jutahy, and Javary, do not even extend to the limits of the widening basin, but wind for many hundreds of miles

through a level forest, and can be ascended immense distances by steamers of small draft, and vessels drawing six feet, it is said, can navigate the Purús between 500 and 600 miles. These rivers are all on the south side of the Amazon, and, strange to say, these are the principal rubber producers. The Rio Negro yields an extremely small quantity, but the Japurá and the Içá send considerable amounts. The Negro is navigable for vessels of large size to Santa Isabel Nova, 400 miles above Manáos; the Japurá is obstructed at a distance of 480 miles by a fall, and the Içá, although not similarly interrupted, is contracted by the narrow gorge, called the Thermopylean Passage, so as to form a nearly impassable channel at a distance of about 200 miles from its mouth.

It will now be easy to construct the outline of the great basin of the Amazon, and this at once gives the area from which comes the bulk of the Pará rubber. There is also to be added the valley of the sluggish Rio Ucayali, in Peru, 100 miles of the valley of the Napo, the same length for the Hualagala, and 50 miles each for the Rios Tigre, Pastassa, and Morona, and the Amazon as far west as the Pongo de Manseriche in the Andes. This vast region is roughly equivalent to a rectangle of 2070 miles in length by 350 miles in breadth, or 724,500 square miles. Upon a most liberal estimate no more than 25,000 square miles of this area is being worked for rubber today, and it is questionable whether the amount will exceed 15,000 square miles. If we now add the area drained by those navigable reaches of the rivers which are isolated by intervening cataracts, we have, along the Araguaya 61,000 square miles, along the Xingú 21,000 square miles, and along the Tapajós about 25,000 square miles. The Bolivian plateau of Mojos, with its great navigable rivers, furnishes another 100,000 square miles of territory adapted to the rubber tree, and from which small quantities of the gum reach San Antonio on the Rio Madeira, in spite of the difficulties of transportation. There is still another region to be included in the estimate, a region which is beginning to force itself into prominence as a producer of rubber indistinguishable in quality from "fine Pará." This is the valley of the Orinoco. The shipments from Ciudad Bolívar are continually increasing, and the physical conditions are favorable for a large development of the industry. Above the great cataract of Mabaracaba the Valley of the Orinoco narrows, but below this point it has a width of from 50 to 100 miles through a distance of 400 miles to the sea, giving an average of about 28,000 square miles. This, then, makes a grand total of 959,500 square miles in South America, in which the best species of *Hevea* are known to grow.

There seems to be considerable misunderstanding in regard to the rubber trees of South America, created by careless, or only partially accurate, accounts of them by various travellers. Orton says that the rubber of the Upper Amazon and Rio Negro comes from the *Siphonia lutea* and *Siphonia brevifolia*. In this he is not entirely wrong. The generic title has been changed to *Hevea*, and the *Hevea lutea*, and *Hevea brevifolia* do grow in the regions Orton mentions. Rubber is also obtained from these trees by the natives, not only in the upper, but in the middle Amazon as well. There are in all, ten distinct species of *Hevea*, widely distributed throughout the valleys of the Amazon and Orinoco, all of which yield India-rubber milk, and, as many of these are not easily distinguished from each other by any marked peculiarity in their external characteristics, it may often happen that the gum from different species is accidentally mixed by those who gather it. The conditions favorable for the genus are, a warm humid climate, low altitude above the sea, and a bottom land subject to annual inundation. According to a very remarkable physiographic map of equatorial

America, published a number of years ago by Von Martius, the area in which these conditions obtain will be found coincident with that calculated above, and from which rubber does actually come.

It appears, then, that there is an immense interior basin bounded on the west by the Andes, on the south by the edge of the Bolivian plateau, on the north by the mountains of Colombia and Venezuela, and on the east by that range of hills coming down from Brazilian Guyana, and extending southward into Matto Grosso, known where it crosses the Amazon, just below Santarem, as Serra de Errere; that this is the source of the bulk, and the best, of the Pará rubber; that within this basin thrive eight or nine species of the *Hevea*, or rubber tree; that there are other immense bottom-lands adapted to the *Hevea* in north-eastern Bolivia, in Venezuela, and on the lower Amazon; and, furthermore, there are nearly 70,000 square miles of similar country in the three Guianas, in which flourishes the *Hevea Guayanensis*, and since the experiments in Jamaica have shown that an inland climate is not essential to success, there is reason to believe that other species of *Hevea* could be advantageously introduced into these northern colonies. Of these ten species there are four from which milk is commonly taken. The most important is that which Dr. Johann Mueller described under the title, *Hevea discolor*, but which is now very commonly confused with the *Hevea Brasiliensis* of the same distinguished botanist. This is a tree of from 25 to 50 feet in height, with a trunk often three feet in diameter. It yields milk in great abundance, and has for much more than a century been known among the natives as the Seringa tree, and on the Rio Madeira it has been called the Boracha. Its natural habitat is the interior basin of the Amazon, the valley of the Negro, and it is also



HEVEA DISCOLOR.

[On a scale of one-half.]

FROM THE "FLORA BRASILIENSIS" OF VON MARTIUS, PUBLISHED IN LEIPZIG.

probable that this is the tree from which comes the rubber of Ciudad Bolívar. The next in importance is the *Hevea Brasiliensis*, which attains a height of from 60 to even 80 feet. The leaves are no more than half as large as those of *H. discolor*, being from two to three inches in length, elliptico-lanceolate in form, gathered three in a cluster like the horse-chestnut. The tree has a tendency to a pyramidal shape, but, growing among others, its branching becomes very irregular, rendering the pale ashy hue of its trunk and branches exceedingly conspicuous. It is the least widely distributed of the important trees of the genus, being confined almost exclusively to the lower Amazon; and is the source of what is termed "Island Rubber." The *Hevea lutea* is another copious yielder of caoutchouc; a large tree, 70 to 90 feet in height; almost dome shaped, when perfect; with rigid, membranous leaves, four to six inches long, of a dusky olivaceous color, obovo-lanceolate in form. It is particularly abundant on the Rio Uaupés, but it is found throughout the great basin to the foot of the Andes, and a variety, *Apiculata*, of the same species, extends up the Rio Negro, and across into the valley of the Orinoco. The *Hevea Nitida* has been persistently confounded with the *H. Brasiliensis*, which it resembles so closely that it can be distinguished from it only with the greatest difficulty. Botanically, however, it is distinct enough, and the rubber it produces is inferior. This tree is found abundantly throughout the length of the Amazon, from the base of the mountains to the sea.

Manufacturers may now begin to surmise one cause of that inexplicable refractoriness which they sometimes meet in rubber of apparently faultless quality, and the desirability of cultivation becomes more evident, by which means it will be possible to obtain the gum of the most satisfactory species of *Hevea*. As for Orton's statement regarding the rubber of Eastern Peru, or Loreto, it would seem that he was not aware of the existence there of the *Castilloa elastica*, from which the principal amount of Peruvian rubber is taken. This is identical with the caucho tree of the west coast—the Guayaquil rubber—and that of northern Colombia, Venezuela, and Central America. It is totally distinct from the Euphorbiaceous *Heveas*, belonging to *Artocarpus*, or bread fruit family, which is more closely allied to the figs. The exact area inhabited by this mammoth tree is difficult to estimate. It will not grow at a high altitude, but it is found in all the low lands along the rivers of Ecuador, Colombia, and northern and western Venezuela. It thrives beside the *Hevea discolor*, but is not naturally gregarious in habit as are the *Heveas*. The gum from the *Castilloa*, as it reaches our market, is inferior, but much, if not indeed the greater part, of this inferiority is due to the carelessness of the *caucheros*, or caucho gatherers, who collect the milk in holes scooped out in the ground beneath the butt and lopped-off limbs of the felled tree, and coagulate it with common brown soap,—for the milk of the *Castilloa*, instead of being smoked, is coagulated by the addition of some substance containing free alkali. Under cultivation this might prove fully as profitable as the *Hevea*, for it is of rapid growth, it yields a larger amount of sap, and by careful treatment the rubber produced from it would certainly be enhanced in value. The exportations of this rubber from Eastern Peru, which are all made from the city of Iquitos, increased from about 160,000 pounds in 1885 to over 300,000 pounds in 1887, but the shipments have begun to decrease on account of the extermination of the trees by the *caucheros*. There is also considerable rubber from various species of *Hevea* shipped from Peru, which is destined to increase with the further exploration of the Rio Javary, and with the establishment of trading posts farther up the Rio Ucayali, which is still held by hostile savages.

Although the rubber of the *Hevea Guayanensis* is not of a superior grade, it is nevertheless of sufficient value to give importance to the tree. It extends over the Atlantic low-lands both in the Guianas and in that part of Brazil which lies north of the Amazon. As a consequence a little of this gum reaches Pará, being brought from Macapá, Chaves, and other towns in the Amazonian archipelago north of the great Island of Marajó. This tree is about 60 feet in height; with a trunk two feet in diameter; wide-spreading branches, covered with dense masses of smooth leaves, the leaves being narrow, obovate, from one to three inches long, and brownish to bluish-gray beneath.

From the foregoing it appears that the choicest spot for the development of the best species of rubber plant is the great interior basin of the Amazon, comprising over 500,000 square miles, and, as every pound of the gum produced here passes through Manáos, it might as correctly be called "fine Manáos," as "fine Pará." Next in importance comes the lower Amazon, with about 145,000 square miles of territory, from which comes the "Island," and some other qualities of rubber, for which Pará is the natural depot. Peru and Eastern Ecuador may be regarded as a separate region, adapted to the *Hevea* and *Castilloa*, and having Iquitos as its commercial centre; while the valley of the Orinoco offers a large area, producing a high grade of gum, with Ciudad Bolívar as its mart, which has an advantage over all its rivals in being at least one or two days nearer the ports of the United States and Europe.

The Dangers of Drinking Rubber Sap.

THE writer while in a rubber store not far distant from Boston, a few weeks ago, heard a conversation between "one who knew" and his companion, which, to speak mildly, was funny, and possibly the readers of the WORLD would be somewhat amused to read it.

At the time mentioned two middle-aged gentlemen entered the store in question and one asked to see some heavy hard rubber dressing combs, and upon learning the price was somewhat surprised that they were so expensive.

"But, my good man," said his friend, "gum is away up out of sight. I'll tell you how it is, you know I am a stockholder in the boot and shoe factory up there at ———, Mass., and know something about their stuff. You see the rubber is the sap of a tree down there in South America. Well, they are obliged to cut down the tree to get it and they have been cutting down trees for years until now they have got back so far from the coast that it takes a long while to get the rubber to the ships, and consequently they can't keep up with the demand. That booms the price, and I will tell you something else very curious about this sap," he continued. "It is very intoxicating and the natives get plumb full on it, but must be careful not to drink water or eat any fruit or food of any kind after it, for if they do they are gonners. The sap is turned into a huge rubber ball in their stomachs and kills them instantly."

After this valuable contribution to the other's meagre knowledge of rubber matters, the gentleman walked out, puffing his cigar with supreme satisfaction, and as sure of the truth of what he had told as was his interested listener. M. M. B.

SOME of the new styles of carpet beaters have soft rubber thongs attached to the revolving drum, instead of leather. It is claimed that the use of these does not crease or soil the carpet, and that, owing to their flexibility, the wear is not so great. For the same reason the traditional slipper in its application to the small boy, might give way to the rubber shoe.

Working Up in a Rubber Factory.

BY A FORMER SUPERINTENDENT.

NO. I.

IT has always struck me as being rather egotistical for a man to spend much time talking about himself. But the editor of the INDIA RUBBER WORLD has urged me to put on paper my experiences in rubber mills from the start, and feeling that possibly some of my adventures and some of the bitter lessons that I got in working up may be of some advantage to the younger generation, I have at last consented.

To begin, I was quite a youngster when first I entered a rubber mill. I was just turning fifteen, and had been rather tenderly reared, knowing nothing at all of work, and a great deal of play; was a fairly good scholar at school, and should probably have followed one of the professions had not the sudden death of my father made it necessary for me at once to earn my own living. I therefore applied to the superintendent of a rubber mill situated not a great distance from my home, and received the assurance that I would be sent for in a few days. I well remember my feelings as I went up to the mill to attempt to get work, the awkwardness and bashfulness that suddenly overwhelmed me, and my stammering replies to the superintendent, who looked me over in a rough, good-natured way. The mill itself was a huge, wooden, barn-like structure, stained in and out with lampblack and lead, the rafters in many places coated deep with whitening; the office, a little dingy box of a place, with hardly room to turn around in, fenced off from the rest of the lower floor by lattice work, which allowed one to look through, and also allowed the volumes of dust and the constant noise to bother those who were in the office. The tremendous clatter of the grinders—which I suspect were not set in the most workman-like manner—the thunder of the driving gears, and the cries of the men who noisily moved rolls of duck and did other work about the factory, made quite an impression upon me, but I felt that the die was cast, and that I was there to apply for work, and work I must have; so, as I have said, I filed my application in due form. After waiting three days I found that the superintendent did not send for me, and feeling that I had his promise, I went down again to discover that he had forgotten all about me. That time, however, he happened to need a boy, and I was at once given a place and told to appear on the following morning at 6 o'clock and be ready to work.

Even at the risk of being a little prosaic, I am going to dwell a moment on my thoughts before entering that mill, because I believe that many a boy before going to work finds himself in much the same predicament. I had seen the inside of the mill, had seen the heavily-built, rough-looking men and the far from attractive boys hurrying around there, and putting things through in a way that led me to believe that they were accustomed to handling without gloves, everything they touched. As I have said, I was tenderly reared, and the feeling came to me at once that in becoming one of that class of workmen and learning to make, as they made, belting and packing and hose and mechanical goods, I should have an apprenticeship that would mean more or less fighting, and no very easy fighting at that. The prospect did not please me particularly, but my mind was made up that I must earn a living, and I was bound to do it even if I got thrashed, so on the following morning 6 o'clock found me waiting outside the gate with a motley throng of boys and men, the former looking at me with exceeding curiosity, and the latter not appearing to think me worthy of notice. When the doors were opened, and we filed in through

the office, I staid back for the superintendent to assign me my work, and—shall I confess it?—inside of the vest that I wore I had concealed a blouse similar to those the workmen wore, for fear I should get my white shirt soiled. I had not reached the point where good sense would have dictated a flannel shirt, and my mother did not know what the work was, or what was necessary, so I found afterwards the blouse came in very handy, although it caused a good deal of laughing among the boys and men from the peculiarity of its cut and fit. After the work had been fairly started, the superintendent saw me, and giving me a broom, started me sweeping in a certain part of the mill where rag stock had been piled in sheets, and where, with whitening scattered between the sheets, this sweeping was far from pleasant, the dust being fearful; but I kept at it until I had the place fully as clean as it ever was before, I think, when the voice of the superintendent was heard calling me, "Here, boy, here," and I was taken down and put along with a gang of boys who were stripping hose tubes off of the poles. In those days the hose business was crude compared with what it is to-day, and the air compressor was not in use—at least not in the mill that I worked in. The mandril, therefore, upon which the hose was made, was carefully slushed with a soft-soap preparation, and after the tube was cured, it was slipped off by twisting around on the mandrel.

It was to this work that I now was put, and for the first half-hour I rather enjoyed it. Being rather apt at "knacks," I soon was able to give the peculiar twist that loosened the tube on the mandrel, and could do almost as much as any of the other boys. This so enthused me that I paid no attention to the blisters that were forming on my hands, and it seems that the superintendent forgot me. When he returned to see how I was getting along, the palms of my hands were covered with such blisters that even his hard heart was filled with pity, although it showed itself in the form of the question, "Why in thunder (the thunder being in the shape of an oath) I didn't tell some one that I was tearing myself all to pieces?" I assumed as brave a front as possible, and intimated that it was an every-day occurrence with me to get my hands so blistered, rowing, and one thing and another, which didn't seem to impress him very deeply. After buttering my hands with palm oil, which, by the way, I thought was called palm oil because it was used for putting on blistered palms, I was sent back to my sweeping. This I could do with tolerable comfort, although there were spots on my hands that would come in contact with the broom, no matter how carefully I handled it. For the rest of the day I was kept busy sweeping, running occasional errands, and packing moulds upon a huge iron car, to be run into a vulcanizer. As far as the workmen were concerned they had been very civil to me, and while one or two of the boys had stopped to make up faces at me, and one had—professedly through accident—dropped a mould on my toe, I had not as yet been obliged to fight as I supposed I should have to do. With a brief half hour at noon, the afternoon went on much like the forenoon, and at 6 o'clock that night, for we worked long hours, I emerged from the mill hungry, tired, and covered from top to toe with dirt and grime, and wended my way slowly home. Thus ended my first day in a rubber mill.

THE Toledo (Ohio) Rubber Co., organized for the sale of rubber clothing and novelties, and to some extent mechanical rubber goods, is composed of men who are said to be experienced in the sale of such goods. Mr. E. C. Deardorff has been for the past eleven years travelling salesman for the Cleveland Rubber Co., while Mr. T. H. Deardorff has been connected with the retail department for the same company five years.



JOSEPH STOKES, Pres't.

W. J. B. STOKES, V. Pres't.

J. O. STOKES, Treas.

Trenton, N. J. Sept. 20th., 1890.

H. C. Pearson, Esq.

Editor "India Rubber World",

New York City.

Dear Sir:- We have been advertising in your paper from its start, and now beg to acknowledge that we are more than satisfied with the good work which you have done for us.

Having no travelling salesman, we are able to sell our goods at a closer margin, as we give to our customers the advantage of the expenses saved in this manner. It is through such a medium as yours however, that we are able to impart this knowledge to the trade. That they appreciate our goods is self-evident from the fact that we are now building a large Calendar and Grinding room, 130 ft. long, 60 ft wide, putting in a new 250 horse Watts-Campbell Corliss Engine, two new large Calendars and six Grinders, in fact, just about doubling our capacity throughout the works.

Yours very truly,

J O Stokes Treas

A Sea Captain's Talk on Rubber.

CAPTAIN PINELL, of the Steamer *Augustine*, which plies between New York and Manáos, brought on his last trip, 377 tons of India rubber, 127 of which were from that port, and 150 from Pará. The steamer arrived September 23. Captain Pinell said in a conversation with a representative of the INDIA RUBBER WORLD:

"We had a pleasant passage the whole distance, and have a good cargo of Brazilian products. Rubber was coming in quite freely when I left Manáos, and the general expectation was that the crop deliveries would be much larger than last year. The river had been very high, and the weather was normal. There was a steamer loading for England, and she was to take a large cargo, over 400 tons from Manáos alone. The Liverpool steamers have an advantage when compared with our own; they remain longer in Brazilian ports, remaining twenty-three days at Manáos.

"In that way, while they are picking up a general cargo, they naturally obtain more of the rubber deliveries. There are more of the English made launches in the river this year, and they were very busy. The overtopping of trees was going on, but I have been going up the Amazon now for more years than I care to name, and there are millions of acres in that region to which man is a perfect stranger, and that the supply of rubber is practically inexhaustible, is a conclusion readily reached by those who know the country. The working on shares is practiced very extensively and it takes so much money to do anything, and none but the largest houses can stand the strain.

"See that case of rubber," Captain Pinell said, as he dodged a loaded truck with which two stevedores were claiming the right of way; "there are 600 pounds in it of fine Pará, a part of a

cargo which in rubber alone is worth \$400,000. At Pará, every one was busy. Señor Vianna, from whom your readers often hear, has gotten to be a Baron. He is a well-balanced gentleman, a little below the average height, light complexion, and well calculated for the heavy responsibilities of the immense business his house transacts."

Captain Pinell on this voyage was accompanied by Mrs. Pinell, who spoke interestingly of the broad swampy Amazon, with its numerous islands, the huge waterspouts seen on the passage, and the little incidents that make up the life of a trip, the first measure of which, between Manáos and Pará, is 1000 miles.

The New Mill at Woonsocket.

WORK on the new Alice mill of the Woonsocket Rubber Co. is being rapidly pushed forward. To the oft repeated question of when the new mill would be started, General Manager Conley can at present give no definite answer. Rubber has already gone through two of the first processes for rubber shoe making, that is, it has been washed and is in the drying room. The last story of the large warehouse will soon be completed and the foundation of the office is ready for the building to be placed upon it. This will be the last position of the mills that will be ready for occupancy, as it is to have a handsome exterior. The inside is to be laid out with special regard to the comfort and convenience of the officers and clerks of the company. Four large elevators have been placed in position, and one of them run for the first time yesterday noon. The engine is being run every day, and the portion of the first floor occupied by it has been divided off by a handsome wooden partition.—*Providence (R. I.) Telegram, Sept. 24.*

REASONS WHY THE

Whitehead Bros. Rubber Co.'s SUPERIOR BELT

IS SUPERIOR.

Hydrant Hose.
Engine Hose.
Steam Hose.
Air Brake Hose.
Wire Suction Hose.
Smooth Bore Suction.
Hard Rubber Suction.
Oil Hose.
Brewers' Hose.

- 1st.—It is made on Mt. Vernon 32-oz. duck.
- 2d.—The duck is coated with a pure Pará friction.
- 3d.—In this belt we use our "Patent Double Binding Strip," which prevents any opening of the seam and practically makes this belt seamless.
- 4th.—The belt is covered and protected by a coating of rubber so dense that moisture cannot penetrate to and injure the duck.
- 5th.—The durability of this belt makes it, in the end, much cheaper than a belt of less price and shorter life.

Machine Belting.
Steam Packing.
Gaskets.
Valves.
Tubing.
Piston Packing.
Rubber Back Packing.
Special Attention Given to Mould Work.

EVERY FOOT OF OUR SUPERIOR BELT IS GUARANTEED TO GIVE
ENTIRE SATISFACTION.

THE WHITEHEAD BROS. RUBBER CO.,

OFFICES AND FACTORY, TRENTON, N. J.

Pioneers of the Rubber Business.

I.

NATHANIEL M. HAYWARD.

AMONG those who were first brought into prominence in the rubber business in the United States, were men to whose lives and work pertained many interesting facts and anecdotes which are now fast being forgotten. In this age even the surviving acquaintances of these early pioneers are fast passing away, and with them much unwritten history is in danger of being lost. The editor of the INDIA RUBBER WORLD has long felt that there should be a record of the lives, and, as far as possible, pen-pictures of these men, not only as a matter of interest to those who may have known them, but as an addition to the history of the India rubber industry. In many cases it will be found impossible to get more than a brief sketch of men who were once prominently identified with the rubber business. Often incidents that will illustrate their special characteristics may not be at hand when their lives are written up. At the same time, whatever can be learned that is of interest to the general reader will be carefully set before him, and, drawing from the best sources, these articles shall be what they purport to be—a resumé of the lives of the founders of the rubber trade.

Among the first of these pioneers was Nathaniel Manley Hayward, who was born in South Easton, Mass., January 19, 1807. When a very young man, Nathaniel Hayward moved to Boston and married Miss Louisa Buke, by whom he had seven children, five of whom are still living. While in Boston he was for some time engaged in the livery business on Federal Street, and it was during that time that he became deeply interested in the attempt to manufacture a waterproof shoe, blacking, for which purpose he began experimenting with India rubber. It is due to him to say that he discovered a most excellent blacking of this kind, and it was in use for a considerable time, but the greater interest in other lines of rubber manufacture that subsequently engaged his attention, crowded out this minor business, and the recipe unfortunately has been lost. Another reason for his allowing this business to lapse was the thought that it might in some way injure the sale of his rubber shoes.

After Hayward had finished his experiments on the waterproof blacking, he began to notice that the rubber shoe was attracting the attention of the public, and with the inventive fever still on him, he began to wish to make a waterproof fabric that should cover one's foot, and form a sandal to be worn outside of the shoe. In this, as has been many times related, he was successful. The discovery of the sulphur cure was an accident, because he knew little or nothing of chemistry, but he was one of those who seemed to have a faculty for the right sort of experimentation. His first venture in this business was when he became the manager of a company formed at the Furnace, at South Easton, which proved a failure, and not only lost money for the investors, but took all of his own. He was not utterly cast down, however, for soon after this he

started a small factory in East Woburn, Mass., and made sun goods which sold very well, and there he bought a small home. He was far from satisfied in the India rubber business, even with the solarized goods, and every spare moment he had he experimented to further perfect his invention. All of this cost money, and at one time, while he continued his experiments, his little house came very near being taken from him to pay the taxes. It was about this time that he met Charles Goodyear.

His next move was to Lisbon, Conn., where he became associated with Gov. William A. Buckingham and his brother, I. M. Buckingham; James S. Carew, of Norwich, and Henry Burr, of Colchester. They secured a factory and commenced the manufacture of rubber boots and shoes. After a few years the plant was moved to Colchester, and was operated under the style of the Hayward Rubber Co., and for many years was the leading manufactory in its line. After Mr. Hayward's death, by a singular chain of circumstances, it lost prestige, and was finally conveyed to the present live manager, since which time the concern has been known as the Colchester Rubber Co.

Mr. Hayward was at one time the owner of a large plant at Providence, R. I., but upon that plant being destroyed by a boiler explosion, he sold the land and secured a large interest in the Boston Rubber Shoe Co., at Malden, Mass., which he afterward sold to the Hon. Elisha S. Converse. He then started a factory at Wyoming, called the Red Mills, and made a specialty of pressed work, and during the Civil War made large contracts and furnished the Government with large quantities of blankets, haversacks and canteens. He also constructed rubber pontoons for Frémont's department, and during the war this mill was run night and day. In 1864, while suffering from Bright's disease, he became aware of the fact that his health was hopelessly wrecked, and closed out his interest in the Hayward Company. Upon the first renewal of the Goodyear patent, Mr. Hayward was its strong advocate, and spent a large sum of money to insure its success, but upon the second application for its renewal, he opposed it.

Mr. Hayward was also the inventor of the wringer roll, which right he sold to Daniel Lyman for a small sum. After the defeat of the Goodyear reissue, he tried to obtain a patent for vulcanite, to be known as the "sulphur" patent, but the paper was kept in a committee and carried beyond the adjournment of Congress, so that the opportunity was lost. His death occurring in the following year, no further efforts were made to push it.

In person Mr. Hayward is described as having been a thick-set, heavy-bodied man, of great physical strength and endurance. He was a slow-motioned man, but had great intellectual grasp and a singular faculty, which amounted almost to intuition, for seizing the right things to experiment with, and letting alone those which would be of no particular advantage. In this connection, perhaps it would be well to relate a story that has often been told regarding the way in which he discovered the process of vulcanization. It seems that he was going by Boston Common, when he noticed a number of men setting iron

posts into blocks of granite, and for this purpose using roll brimstone to hold the iron in place. In examining this carefully, as he examined nearly everything he saw, he picked up a bit of the brimstone, and, without thinking, carried it away with him. Later, when he was experimenting with the India rubber, he put almost everything that he had into one batch, and among other things, a piece of this roll brimstone. That batch came out, and when put in the sun became partly vulcanized and he was delighted. He therefore started right in and made up another batch, but not having any brimstone, did not put it in, and did not remember anything about it. That lot of cloth, therefore, was as bad as the worst he had ever made. For a long time he experimented in this way, trying to win back the secret that he had stumbled upon in one experiment, but without success. Finally, one night, dreaming as usual of the production of a waterproof cloth and all it should bring, he thought he was again passing Boston Common, that he found a piece of roll sulphur and put it in his batch and it came out all right. Securing some sulphur the following day, he tried it, and the result was that he had at last discovered a part of the secret of vulcanization.

Every-day Work in the Factory.

BY NICK R. AUGUR.

IT is oftentimes a thankless task to take up somebody else's fight. Nevertheless, I am about to do that because I was exceedingly interested in the discussion started last month about the crowning of calender rolls, and furthermore, the editor of the INDIA RUBBER WORLD seemed perfectly willing that I should take a hand in it. I am, however, going to make others do the fighting while I stand back as a second. My method of bringing the contestants together is a very simple one and consists simply in interviewing those who are supposably most interested in either the manufacture of rubber goods or the manufacture of rubber machinery. The latter class I have interviewed very carefully. Going to one prominent manufacturer, I find that he has calenders in all parts of the world; in the old-fashioned machines that he made, none of the rolls were crowned, but all of those made within the past few years have the top roll crowning. He is very busy, and having extracted that information, I leave him. In the course of a week it so happens that I am in the vicinity of two large establishments, both of whom are well-known builders of rubber machinery. The first of these I visit, and ask the question about the crowning of the rolls. The answer comes at once that during the past ten years they have made but one calender in which all the rolls were straight, and that being on a special order. Going a short distance to the next establishment, which is one of the largest in the world, and has a reputation for fine work in rolls that it would be very hard to surpass, I find the superintendent up in the drafting room and ask him about the crowning of calender rolls. He goes into a little more explanation than the others.

"Now suppose," he says, "one wants to run as thin a sheet as possible of pure gum. To do this the top roll must be screwed down tight, and being thus brought down hard against the next roll, when the gum goes through it causes a certain spring in the rolls, and the only way to overcome this is by a slight crowning of the top roll. For goods that are made roughly there is no need of any crowning, nor is there for thick sheets. Where gum is spread upon the cloth too, it is not advisable to try to drive the gum too deep into the cloth. It just wants to be put on there enough to stick, and for that reason the rolls are not set down together. If any one will observe a calender carefully, they will notice that the screws of the top roll wear out first, and those on the bottom rolls very rarely need any repairing at all. The same problem in crowning rolls we meet in the manufacture of paper calenders. In this sort of business, however, we crown simply the bottom roll, which, by the way, is a roll fully as large as a calender roll."

With this expert testimony from the builders of almost all the calenders in the United States, it seems to me that the question was pretty well settled. I, however, went on and talked with several superintendents. Those superintendents who were in the habit of running the finest goods, I found thoroughly in favor of the crowned roll. Those who made heavy goods, where the top roll was not necessarily set down hard against the next one, had never had the problem brought before them very much, and seemed to be doubtful, from which I argued that the question of crowning a roll does not affect all of those who run calenders, but for pure gum work, for dress shields, for surgical work, and the finest sort of calendering, there is no question but what it is a necessity.

Tightening Valves with Hard India Rubber.

THE effectiveness of hard India rubber in tightening valves of high pressure pumps is said by the *Mechanical World* of London to be very great. The subterranean drainage works at the Maybeach mine at Saarbucken have run for five years, averaging daily ten hours, with 60 to 72 double strokes per minute, and under a pressure close to 50 atmospheres, without requiring a renewal of any part of the valves—a result which comparisons show to be due to the use of the India rubber. This must however, be neither too soft nor too hard or brittle, and particularly not unevenly hard.

Rubber Masks for Powder Makers.

THE men employed in the factories in which smokeless powder is manufactured in Berlin, have been provided with rubber masks to protect them from the fumes thrown off by the chemicals entering into the composition of the powder. Heretofore the men have suffered greatly from this cause.

FIRE in the factory of the Standard Rubber Co., at Brockton, Mass., September 24, destroyed about \$1000 worth of stock. The building was but slightly damaged. The fire started in the drying room just before the help left the factory, and caught by a piece of stock falling on a steam pipe. The loss is fully covered by insurance.

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BIRMINGHAM IRON FOUNDRY, Birmingham, Conn.

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EUREKA FIRE HOSE CO., No. 13 Barclay Street, New York.

BELTING (Rubber).
BOSTON BELTING CO., No. 236 Devonshire Street, Boston, Mass.

BOSTON WOVEN HOSE CO., No. 226 Devonshire St., Boston; 222 Lake Street, Chicago; 8 Bush Street, San Francisco.

BROOK, OLIPHANT & CO., Trenton, N. J.
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NATIONAL INDIA RUBBER CO., No. 55 Westminster Street, Providence, R. I.; Bristol, R. I.; No. 28 Lincoln Street, Boston, Mass.; No. 415 Commerce Street, Philadelphia, Pa.

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 HOME RUBBER CO., Trenton, N. J.
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 IDEAL RUBBER CO., Brooklyn, N. Y.
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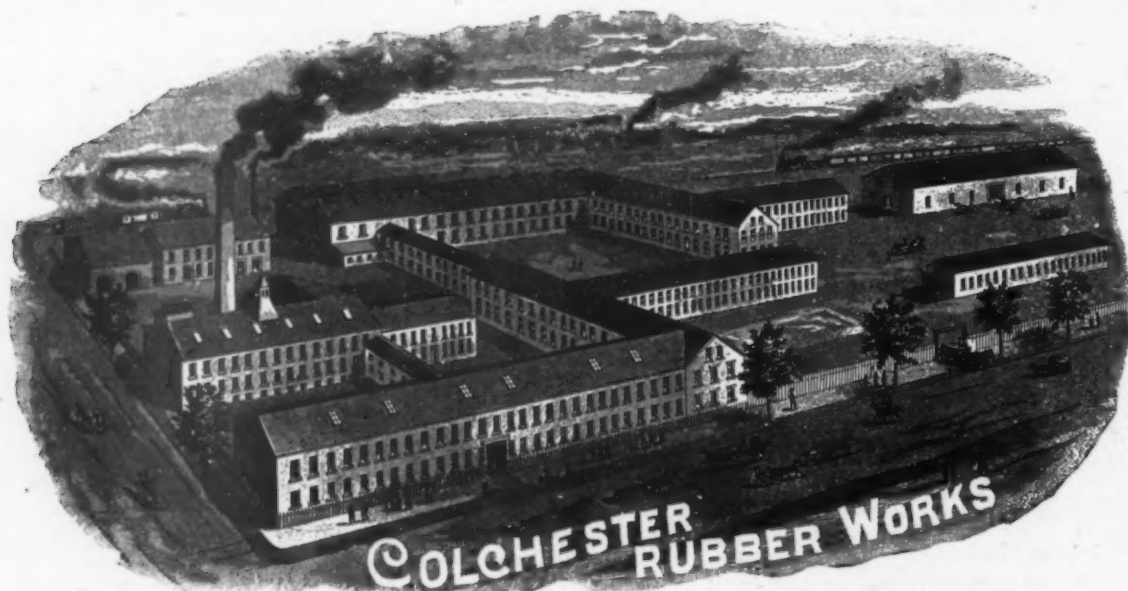
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- No. 432,612.—Ear Protector; George B. Hamilton, Memphis, Tenn. A rubber plug to fit the opening in the ear, combined with an open plug-holding frame made of elastic wire to fit closely around the base of the ear, both the upper and lower ends of the wire extending forward behind the upper and lower ear-lobes, and then, respectively, downward and upward toward each other in front of the ear, whereby the frame is held from accidental displacement in any direction.
- No. 432,726.—Machine for Manufacturing Weather-Stripping; William H. Cosper, Chicago, Ill. This machine is for making the ordinary metallic and flexible weather strips, and consists of the combination of a die adapted to admit of the continuous and simultaneous passage of the metallic and flexible materials, and to turn or form the metallic strip so that it embraces the flexible material, and a means for buffing the strip as drawn toward the die.
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- No. 432,967.—Overshoe; Charles J. Bailey, Newton, Mass. This is the well-known "Water-tight Foothold," recently illustrated in the INDIA RUBBER WORLD. The claim is for a transversely-tubular projection at the rear of the ball of the shoe for the purposes set forth.
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- No. 433,185.—Dental Vulcanizer; James E. Quinn, Boston, Mass. A dental vulcanizing apparatus, having on its upper portion a recessed enlargement, at the top of which is provided an elliptical mouth, an elliptical cover formed to bear against the under side of the top of the said enlargement entirely around the mouth, said enlargement being formed to permit a cover to be inserted in a position at right angles to its operative position and then turned to the position last named, and means for detachably securing said cover to a receptacle and pressing it against its seat.
- No. 433,215.—Insulating Compound; Israel Rabinowicz; Schenectady, N. Y. A compound for insulating, fireproofing, waterproofing, which consists of tartaric acid, gilsonite and pitch. The following proportions are given:
- | | |
|---------------------------|------------|
| Palm stearine pitch..... | 70 pounds. |
| Gilsonite..... | 40 pounds. |
| Potassium bitartrate..... | 9 pounds. |
| Tartaric acid..... | 2 pounds. |
- No. 433,226.—Artificial Leg; George Beacock, Brockville, Ont. An artificial limb having a cushion with the socket composed of a rubber filling, a flexible covering having its free edges inserted in the socket, and a facing having its free edges secured to the surfaces of the socket.
- No. 433,284.—Non-conductive and Ornamental Handle for Vessels; William P. Gould, Newtonville, Mass. A non-conductive handle, composed of parallel layers of mica strung on a suitable support. It may be used in the place of a rubber insulator for linemen's tools.
- No. 433,370.—Abdominal Supporter; Hannah E. Rogers, Portland, Me. An abdominal supporter comprising the opposite similar side bands of inelastic material, their vertically front and rear portions connected by straps or cords at their ends in front and at the back, and provided with elastic bands which connect with the said front and rear portions of the same side, and with the elastic bands adjustably connecting the vertical rear portions of the two side bands.
- No. 433,460.—Weather-Strip; Isaac F. Field, Sandy Lake, Pa., and Sylvester Byers, Butler, Pa. A weather-strip consisting of a rigid plate secured to one corner of a door, a movable plate applied to the opposite corner thereof, a flexible strip extending along and normally resting upon the edge of the door, the ends of the strip being secured to the plates, and projections engaging the movable plate and door-frame with a longitudinally supporting-bar secured to the said strip.
- No. 433,470.—Boiler, or Pipe Covering; Henry W. Johns, New York, N. Y. A compound covering-fabric consisting of a sheet composed of sponge and paper-stock, and a coating of soft, open, or loose fibrous asbestos, the sponge and paper-stock constituting the body, and the asbestos the surface portions of the sheet.
- No. 433,471.—Non-Conducting Covering; Henry W. Johns, New York, N. Y. A non-conducting covering composed, essentially, of wood pulp mixed with sponge, or other fibrous or porous material, and treated with fireproofing material.
- No. 433,472.—Non-Conducting Covering; Henry W. Johns, New York, N. Y. A covering composed of superposed layer of soft, porous wood pulp, fireproofed, with an interior lining of fireproof material.
- No. 433,473.—Non-Conducting Covering; Henry W. Johns, New York, N. Y. Covering composed of superposed layers of fireproofed soft, porous wood pulp, mixed with fireproofed comminuted sponge, or like bodies.
- No. 433,478.—Horse-Boot; Lewis S. Lee, Philadelphia, Pa. A non-interfering device for horses, consisting of a leg strap for attachment to the leg of the horse, a supporting piece carried thereby, a laterally-projecting stem, and devices, such as rubber balls, carried thereon to form a laterally projecting striker, and a support formed between the inner end of the striker and the supporting piece to maintain it in a horizontal position.
- No. 433,920.—Joint for Electric Conductors; George L. Wiley, Arlington, N. J., and Edward G. Acheson, Pittsburg, Pa., assignors to the Standard Underground Cable Co., of Pittsburg. A joint for electric cables in which the conductors are united, and surrounded with insulating material, and covered with a protective metallic coating, the spaces at each side of said coating being filled with said insulating material.
- No. 433,921.—Joint for Electric Conductors; same inventors, same assignors. A joint for cables in which the naked

conductors are united, the insulating material and protective covering being removed for a certain distance each side of the joint, and the intervening space filled with strips of insulating material, and the joint covered with an insulating-sleeve.

- No. 433,922.—Joint for Electric Conductors; same inventors, same assignors. A joint for electric conductors in which the insulated and protected conductor is exposed at its adjacent ends, and the ends of the cable are joined by a sleeve of insulating material closely fitting the metallic coating at the adjacent ends of the cable.
- No. 434,007.—Machine for Covering Insulated Conducting-Wire with Lead; Lewis W. Tracey, New York, N. Y. This consists of a cylinder set vertically, a horizontal core-bar arranged within the lower end of the cylinder, opposite concentric transverse openings in the walls of the cylinder, one of which communicates with the interior of the core-bar, and a die located at the opposite opening.
- No. 433,008.—Machine for Covering Insulated Conducting-Wire with Lead; same inventor. Combination of the lead cylinder and a block occupying the end thereof, this block carrying both the core-bar and die, and the walls of the cylinder being formed with corresponding openings.
- No. 434,282.—Brake-Hose Coupling; Edwin A. Leland, Brooklyn, N. Y. A combination with separable coupling-heads, of coupling bars having springs which draw the coupling-heads together, and coupling-levers by which the said springs are placed under required tension. These levers are provided with swinging yokes or loops, engaging hooks on the opposite coupler heads, and having projecting guides near the yokes or loops for guiding the levers and effecting the proper engagement of yokes or loops with the hooks.
- No. 434,303.—Clothes-Wringer; Charles K. Stinson, Boston, assignor to the Colby Wringer Co., Montpelier, Vt. This is in brief a combination of stationary outer jaws, rubber squeeze rollers, a suitably-supported clothes-board with cams at each end, movable inner jaws held upon a suitable support and provided with journal bearings and slotted extensions in which the cams operate.
- No. 434,346.—Ink stand; John Larkin, Bradford, Pa. The body of the ink stand is provided with a cover, which has a vertically moving cone provided with a stem extending through the cover, and an elastic ball having an opening for the inflow of the ink, which is applied to the lower end of the stem.
- No. 434,505.—Eraser; Archibald F. G. Daniels, Walthamstow, England. An eraser directly connected with a spring within a case, which spring serves automatically to pull the same inside the case.
- No. 434,583.—Shoe Holder; John B. Cornwall, Moline, Ill. This consists of a holder or hanger for either leather or rubber shoes, made of a loop of wire or suitable material loosely hinged at its upper end to a back or other support, having a cross-bar or bail to catch under the heel and hold it in position.
- No. 434,619.—Horse Boot; Martin V. Yerkes, Berwyn, Pa. This consists of a guard, formed of moulded rubber balls loosely strung upon a curved or looped strip of leather or raw hide, or other suitable material, secured to an upper and a lower leg-strap, with fastening means for it.
- No. 434,670.—Buggy Boot; James K. Loree, Howell, Mich. A buggy-boot make up of an outer waterproof fabric, an under textile fabric, and a series of ribs located between the covering fabrics, and an interposed gutta percha cement or tissue, made adherent thereto, for cementing the parts and retaining them in position.
- No. 434,866.—Apparatus for Coating Wire; Charles Q. Goodwin, Malden, Mass., assignor to P. B. Wiley, Wakefield, Mass., and the Bell-Rock Electrical Conductor Co., Portland, Me. This in brief is the combination of a fixed head, having a tubular boss or fixed piston, a movable reservoir having a cavity fitting the piston and provided with a tube extending upward from the bottom into the tubular piston, means for impelling the reservoir and the mould within the said tube, the mould and tube having openings for the passage of material from the reservoir into the mould.
- No. 434,885.—Electric Conductor; William A. Phillips, Schenectady, N. Y., assignor to the Edison Machine Works, same place. The combination with a wire of flat strips of absorbent insulating material applied longitudinally to the said wire, the strips being individually in a folded condition, and being treated with an adhesive compound of resin and vaseline for holding them together.
- No. 434,890.—Weather-Strip; Clifford Saville, Hackensack, N. J. Consisting of a flexible cushion made up of a strip of rubber folded to bring its longitudinal edges together, with another re-inforcing strip of rubber inserted between the folded strips and firmly secured in place by coarse stitching passing through both strips immediately below their top edges, being in combination with a metallic housing or back, one edge of which embraces the stitching of the flexible cushion.

How the First Rubber Shoes Found a Market.

MR. GEORGE WATKINSON, president of the Colchester Rubber Co., tells a very interesting story about the introduction of rubber shoes in this country. It seems that after Nathaniel Hayward had gone to New Haven and had succeeded at the Candee factory in making some rubber shoes that were all right, the next thing was to find a sale for them. A man named Henry Downs, afterwards a prominent rubber shoe man, took a lot of them, not in cases but in a market basket and went to Hartford. There he found the dealers afraid of them—they looked so fragile when compared with the bulky shoes of pure gum that had come from Pará. However, he sold a few and gave away some, and going on to Springfield and Worcester pursued the same policy. As soon as the goods were put into actual use there was a call for them and this primitive way of starting their sale proved effectual. Years after this Mr. Downs told the story to Mr. Watkinson. Soon after the death of the former, Mr. Watkinson met a gentleman named Ensign when travelling, and when the talk turned naturally upon rubber shoes Mr. Ensign said:

"I bought the first pair of rubber shoes ever offered for sale."

His listener expressing an interest in this statement, he continued: "I had a store in Hartford and a man came up from New Haven with a market basket full of rubber shoes, and I bought the first pair."

THE United States Express Co. have made special rates for the manufacturers of leather and rubber boots and shoes who express to and from New Brunswick, N. J. Formerly they charged 50 cents per 100 pounds which they have reduced to 35 cents.

Hoolihan's Lightning Express Shoe.

"HOW is it that pable invints things?" asked Hoolihan one day while looking enviously at a new style of football that was selling remarkably well.

"Easy enough," replied his clerk. "Just think of something that everybody wants, patent it, and you will be rich."

"That sounds aisy," muttered the proprietor, "but phwat does pable want? Sure tin minutes ago I could think av many a thing that I naded mesilf, but, begorra, I'm stumped now. Av it wasn't for stame cars bein' ahready goin' I could think av thim. Thin there's that electricity light. Eddie phat-iver-his-name-is has invinted that before I had a chance. Now, there's the company phwat got up this rubber. Couldn't I have thought av that as well as thim? An' now me shance is—Tim there, phwat the tunderation are yez doin' in the show case? Come here, ye product av Oirish invintion."

The boy advanced slowly, with a guilty air, and stood before his parent.

"Let's see phwat ye have," was the command.

Reluctantly he held out a rubber shoe, on the bottom of which was fastened a rubber ball.

"Phwat's that fur?" scornfully asked Hoolihan.

"I wanted it to jump wid," said Tim. "Sure av only I had spring enough in me fate, I could bate Mikey Driscoll leppin'."

"That fur a rason," was the stern reply. "Clear away home out av this, spoilin' me stock wid foolishness."

Tim departed much crestfallen, while his father surveyed his handiwork with a look that was far from being hostile.

"Av there isn't an idea in that me name is mud," he said, gleefully. There is a want fur yez! Make a shoe that'll help a man to run and lape, and begorra how it will sell. It's a great thought entoirely. A boot wid rubber springs on hale and toe; by gar, I belave a man could almost fly. Stame cars, indade! Sure Jay Gool will be me mortal inimy whin he learns that ivery man, woman and choild will be their own stame cars."

Full of his idea, Hoolihan hurried off to a rubber factory and ordered a set of huge hollow springs, shaped like balls, with straps for attaching them to his shoes. He had to wait for these, much to his disgust; but finally the day came for their delivery, and he was in a fever of excitement. While he waited a commercial tourist came in.

"Anny thing new in rubber shoes?" asked Hoolihan, mechanically.

"Nothing particular," was the easy reply, "except the new Lightning Express shoe."

"Loightning Expriss! Phwat's that?"

"That's a great invention. A bright fellow conceived the idea of fitting a rubber spring on the sole of a shoe so that people could travel faster."

"Did it worruck?" gasped Hoolihan.

"Work? You ought to see it. Why, just an easy jump will carry a man a thousand feet. To step up on the top of a five-story building will be nothing."

"Bad luck to him," wailed the Irishman.

"They say an active man can outrun a train of cars."

"Don't tell me any more," shouted Hoolihan, purple with rage. "Sure the shance av me loife has gone. Av it hadn't been for this crazy invintor I'd have been a millionaire."

"But I don't understand!" said the drummer.

"It isn't necessary that you should oondersthand," roared Hoolihan, "but I'd loike to break your nick fur bringing me bad news."

"I'm sure I'm very sorry, but what can I have said that troubles you so?" was the innocent response.

Moved by his contrite manner, Hoolihan cooled down, and said: "Don't moind me, bye; shure it's a nashty timper I have whin I'm disappointed. May ye niver have the visions av riches that I've had, only to lose thim! But the worrust is pasht, I'm mesilf wonce more."

"Don't apologize, Mr. Hoolihan," said the drummer, cordially, "there is no need of it. I saw at once that you were not yourself, although I could not imagine why. But to go on with my story. It is said that people living in Jersey City will no longer need ferry boats to cross to New York. A company has been formed to put half a dozen large stepping stones between the two shores, and with this Lightning Express shoe they will be able to cross—"

"No more! No more!" said Hoolihan, with dignity. "Ye may think it strange, but I can't bear any more. Let's shange the subject."

"A package for Mr. Hoolihan," announced the expressman, bringing in a parcel which he at once recognized as the springs, now, alas, patented by another and lost to him. He laid them sadly on a shelf and the drummer went out.

That evening Hoolihan sat brooding on his loss, when it occurred to him that it might be well for him to take a walk.

"I'll put on the springs," he said to himself, "an' av I can make no money out of it, at laste I can do some leppin an' runnin' that will make the pable about here craazy."

So he went down to the store, lit the gas, buckled on the springs, and slipped out into the back yard. In ten minutes he came in again covered with mud.

"I belave that drummer was lying to me!" he muttered as he threw the springs into the furnace and with a grim satisfaction watched them burn.

The Acid Cure and What It Accomplishes.

IN almost all rubber factories where general work is done, there has been some attempt to utilize what is known as Park's Cold Curing Process. Many times the experiments have resulted in absolute failure. In other cases the goods have looked very nicely, and the experimenters have been much pleased with the results until they found that after a time the rubber deteriorated rapidly, and thus rendered their experiments of no effect. The trouble has been that enough care has not been taken in repeated trials. The proper length of time has not been allowed for curing the goods with the chloride or else it has not been eradicated from the rubber after it has completed its work of vulcanization. In the first place, chloride of sulphur itself should never be used, as it will entirely destroy the article to be vulcanized. The ordinary formula for thinner articles is: 1 part of chloride of sulphur, by weight, reduced with 30 to 45 parts, by weight, of bisulphide of carbon. In the practical use of this solution there is a certain trouble, as the fumes are more or less disagreeable and in some cases are said to have very injurious effects upon the health of the workmen. In fact there are those who go so far as to claim that it has affected the minds of some of the help, and they have become almost insane from breathing the fumes of the chloride of sulphur. This, however, can be very easily obviated, and the chloride used without danger, by the preparation of vulcanizing boxes with glass tops and hand-holes for the introduction and removing of the articles to be vulcanized. The box can be so covered with an arrangement something after the fashion of an inspirator so that every bit of the gas can be blown away from the workman's face, and carried entirely outside of the building by suitable pipes.

It must be remembered from the start, however, that the

chloride of sulphur, if anything, is too energetic, even when strongly diluted with bisulphide of carbon. One of the first things for the experimenter to decide upon is the strength of solution that he wants for certain articles. Thin articles must have the very dilute solution quoted above. If the articles are thicker, it is better to take a solution as thin as that, or even thinner, and by repeated plungings in the solution, obtain the vulcanization. While one part of chloride of sulphur to 80 parts of bisulphide of carbon is often recommended, the dilution is even carried beyond that with the best effects. It will be seen, therefore, that no actual rule can be given, but that it must be a matter of judgment, and he who uses the best will naturally get the most satisfactory results. After a piece of rubber has been dipped in the chloride of sulphur and left, say a minute, or perhaps a second or two over, it should be taken out and immersed in water and carefully washed, to remove every trace of the sulphur. This process is imperative, as the chloride otherwise would get in the pores of the rubber and continue its process of vulcanization until it is destroyed. It is exceedingly easy to burn rubber with this solution, and not always easy to detect it at the time when the vulcanization takes place, and it is therefore, wise, in trying experiments of this kind, to work up carefully to the curing point and never to go beyond that.

After the washing of the vulcanized rubber, it is an excellent plan to have it dried in a room where there is a current of warm air, or better still, in a box through which an exhaust of warm air passes, which may run up as high as one hundred degrees of heat. This not only carries away the moisture, but also materially assists in freeing the rubber from any little atoms of the chloride of sulphur or bisulphide of carbon that may not have been thoroughly washed away. It is often a good plan to potash goods that have been cured in this process, as there may be a trace of free sulphur still remaining, and for this purpose the ordinary washing apparatus that almost all druggists' sundries men have will be perfectly adapted.

Enlargement of a Rubber Plant.

THE HOME RUBBER CO., of Trenton, N. J., are compelled by the pressure of business to materially enlarge their plant. They are therefore erecting a brick building, 130x60 feet, which from floor to the peak of the roof, will be nearly 40 feet in height. The roof will have a monitor top, and with the 8 feet windows in the walls will form an exceedingly light and commodious calender and grinding room. This room, by the way, will be fitted in the most complete manner for labor saving. The floor will be of granite, and will have a series of tramways for carrying stock from the storehouse to the grinders and from the calenders to the making-up departments. There will also be in the rear of this a compound room 50x50, and beyond that, a fireproof storehouse, 130x35 feet. Between the present plant and the new one will be set a Watts-Campbell Corliss engine, of 250 horse. There will also be several new calenders, grinders and presses to be set in the new plant, which is to be finished and the machinery in motion by the first of January. The plant when completed will be one of the most perfect and convenient for the manufacture of a general line of mechanical goods that could be imagined. It is situated on the line of the Pennsylvania Railroad, and is also close to the Delaware & Raritan Canal, which gives the company the best of shipping facilities. The amount of room that will be enclosed in the completed mill will be seen to be very large, as it will exceed sixty thousand feet of floor space. The goods of the Home Rubber Co. have within the past few years won a host of friends in both American and foreign markets,

and it is to this popularity that the remarkable growth of the company is due.

The Editor's Tennis Shoes.

DURING the month of August the editor of the INDIA RUBBER WORLD fled away from the haunts of men, especially rubber men, and hid himself in the wilds of Northern Maine. There, clad in flannel shirt and antiquated trousers, his head covered with a tourists' helmet, and his feet shod with tennis shoes, he tramped, fished, rode and picnicked to his heart's content. It is, however, with regard to his footwear that he wishes to speak. Just before he went away a pair of tennis shoes were presented him to be tested. They had a rubber sole, a felt innersole, and a perforated leather innersole. It was this shoe that the editor wore. In a pair of them he skirted innumerable ponds, climbing over rocks hot with the noonday sun, and anon slipping down on ledges that ran far under water. He tramped in them on the sandy plains to Blueberry hill; he climbed Mount Zircon's rugged heights; he followed trout brooks for miles through forest and swamp, and he wore constantly the Ventilated Tennis Shoe. He therefore takes this means of thanking the Boston Rubber Shoe Co. for producing such a comfortable article in footwear.

Letters to The Editor.

India Rubber Artificial Flowers.

EDITOR INDIA RUBBER WORLD: Some time ago I visited a fair where there were a great many curious things, among others a lot of artificial flowers. My first thought was that they were made of wax, until the person who had them in charge informed me that they were made of India rubber. The leaves, and, in fact, the flowers themselves were quite flexible, but I did not believe they were made from rubber, and don't feel sure of it yet, so I write you to know if I was made a fool of. Trusting that I am not trespassing on your good nature.

F. T. S.

San Francisco, Cal., August 30, 1890.

[The best artificial flowers we have ever seen were made, stems, leaves, blossoms and all of India rubber. They are produced both at home and abroad. Paris and New York both make goods of this kind that almost rival nature's handiwork.—EDITOR.]

Rubber Trees in Florida.

H. C. PEARSON, EDITOR: I have sent a man to find a bottle of sap, and shall take great pleasure in sending some to you. There are many wild rubber trees in this section, but I doubt if they are the India rubber of commerce. However, the latter can easily be grown here, and are listed in nurserymen's catalogues. Land (wild) is held at from \$100 to \$150 per acre, but can be purchased for less a few miles either north or south. Any further information you desire I shall take pleasure in giving you. Very truly yours,

A. V. A. WINANS.

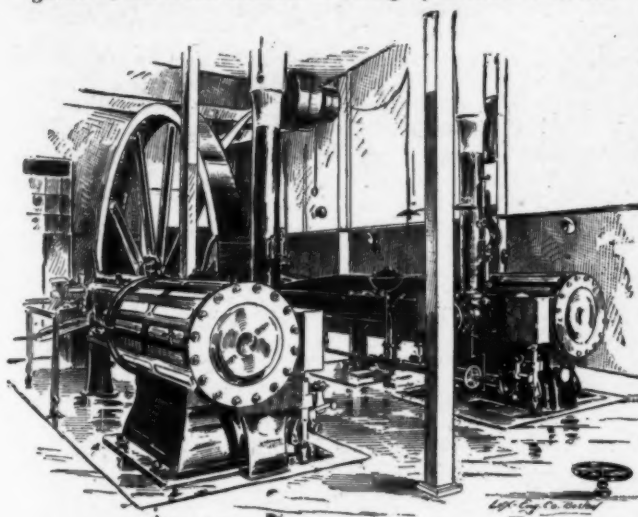
"Linwood," Eden on Indian River, Fla., July 21, 1890.

[The writer is a nephew of the president of the Peerless Rubber Manufacturing Co. of New York, and has a fine estate in Florida. Further communications from him will be awaited with interest and will be given to our readers.—EDITOR.]

A PLANT for the manufacture of rubber stamps and rubber type has been established in connection with the *News* office, in Fort Wayne, Ind. These stamps seem to be taking away a part of the small work of the job printer in very many towns.

A Visit to a Great Rubber Factory.

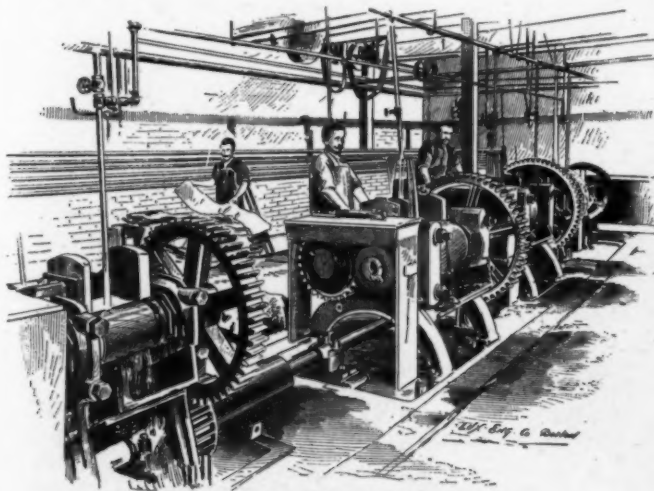
THE reading public have many times been introduced to the forests where rubber is gathered, to the natives who gather it, and to the methods of curing, by article and illustration.



CUT NO. 1.—ENGINE ROOM.

tion, but it is very rarely that they have been in the same way led into a rubber factory, and it is still more rare for any one to have gone through the factories and to have seen the processes of manipulating the gum and of making up the goods. Through the courtesy of the Pará Rubber Shoe Co., the INDIA RUBBER WORLD is enabled this month to introduce its readers to an exceptionally fine plant by means of illustration and description.

The plant here described is situated at South Framingham, Mass., on the line of the Boston & Albany road, and consists of a series of brick buildings set in a large rectangle, at one corner of which stands a handsomely finished cottage, which contains the offices of the superintendent, treasurer, and the



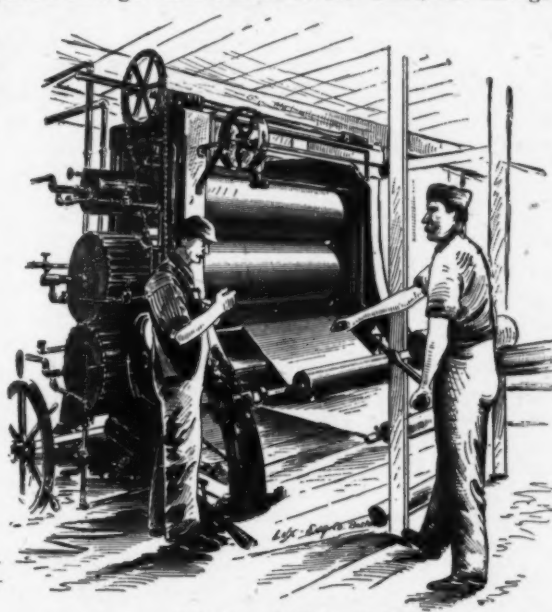
CUT NO. 2.—WASHING ROOM.

clerks. On entering the factory yard, one is at once pleased with the neatness with which everything is kept—with the green grass, with the closely trimmed turf that appears between

the broadly gravelled drives, with the carefully painted fences, and the air of thrift and business-like cleanliness that pervades the whole.

The engine-room is naturally the first place visited, where are to be found huge twin engines that run so smoothly that there is no perceptible jar or "thump" anywhere in the length of their stroke. With the huge gear that runs on the main shaft of these engines engage two other great gears which each drive heavy shafts, over which the machinery of the mill is set.

From the engine-room the washing-room is naturally the next one to visit, as it is here the first process of handling the rubber is gone through with. The rubber comes to this room in the crude state, is soaked in huge vats of boiling water, and is then given to the men who stand in front of the machines, shown in our second picture. These machines consist of a pair of corrugated rolls running toward each other, and set close together. Above the machine is a water-pipe, which sends down streams, either of warm water for washing, or cold water for sheeting, just as is desired. The crude rubber is passed through these washers several times, the corrugated



CUT NO. 3.—CALENDERING ROOM.

rolls tearing it apart and allowing the water to wash out all impurities. The rubber is then, when thoroughly cleansed, run through into very thin sheets and is taken to the drying-room, where it hangs for a long time drying out and seasoning.

In cut No. 3 we meet the rubber again as it comes from the drying-room and is put upon the rollers to be massed, and later to be mixed. The massing consists of a grinding on smooth rollers that makes the texture of the gum finer and homogeneous, so that it may be ready to receive the compound that is a necessity in its cure. The method of compounding is simply to wind the rubber in a thick sheet around the slow roller of the mixer, and to take the sulphur whiting and lampblack and place them in a little heap between the rolls. The result is that a mechanical mixture is formed in a very short time and is very perfect, the whole appearing like a mass of the blackest of black rubber, and showing no sign at all that any compound had been put in it. While speaking of compound, we might say that rubber thus handled

and filled with a certain amount of filling material will last a great deal longer than pure gum which contains only the sulphur.



CUT NO. 4.—MIXING ROOM.

After the mixing comes the refining, in which the rubber is run through the most tightly closed rolls to be careful that no part of it is in any way coarse, or unmixed. The gum, if it is to be used at once, is all ready for the calender. If to be used a little later, after the mixing it first goes to the warmer, which is merely a large mixing mill that, like all the rest, has hollow rolls and is heated by steam, and the rubber is warmed up so as to be soft and plastic. The calender is a huge machine that may have either three or four rolls of chilled iron, the dimensions of the rolls being, as a rule, 60 inches long by 20 inches in diameter. This machine is so arranged that the rolls may be raised and lowered, so that any thickness of gum can be pressed out through them. At the same time, it takes very skilful help to run one of these carefully, as the coatings must be very exact. The gum is run through these rolls into thin sheets. The engraving that is shown on rubber shoes, the pebbling on boot



CUT NO. 5.—SHOE ROOM.

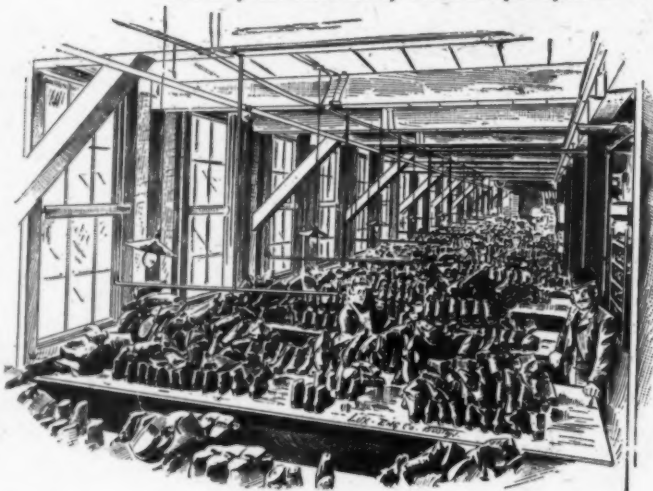
legs, and such work as that, is done on a special calender, with carefully engraved rolls. For the soling is also a special calen-

der, called the soling calender, through which the gum is run in heavy slabs and pressed into the proper shape.

The cutting-room is the next place to which the gum goes, after being spread in sheets, where it is cut into the right shape, put into books to prevent its sticking together and carried down to the making-up rooms.

Figure 5 shows a portion of a shoe room, where on frames before them are set the wooden lasts over which the rubber shoes are made up by the skilled help. If one would multiply this picture by one hundred, it would give a fair idea of the size of a modern shoe room. The process of making-up in the case of rubber shoes is simply the cementing of the various parts together over a maple last and the covering of the whole with a coat of elastic varnish.

Vulcanization is the next step, for which purpose the shoes and boots are placed upon iron cars and run into huge steam heated rooms where they are kept for several hours at a temperature of 270. This baking process is one that requires a great deal of skill, and only the most trusty hands are put upon it.



CUT NO. 6.—PACKING ROOM.

Cut No. 6 shows a portion of a packing room, where the shoes have been run from the vulcanizers on their iron cars through to the long tables where they are piled according to sizes, with the lasts still in them.

The next process is the taking out of the lasts and sending them back to the shoe room, the testing of the shoes to see that they are perfect, and the packing either in cases or in cartons for the market.

After having seen this last act in the process of rubber boot and shoe manufacture, it is probable that Superintendent Thomas would take one into his office and tender him a tiny pair of shoes that he gives to favored visitors, and if one is of the masculine gender, it will be accompanied by a first class cigar.

The Pará Rubber Shoe Co. have a capacity of 17,000 pairs of boots and shoes a day, and have a mill that is running busily nearly all the time. To one who is passing through South Framingham on the Boston and Albany, the plant can be seen to very good advantage from the car windows. Whether or not the stranger coming there without credentials would receive a pass through the

mill, we cannot say,—in a probability he would not, but should any one ever have the invitation to visit this, or any other rubber mill, we should advise them to do so, as they will find the processes even more interesting than words or illustrations can set forth.

Shoe Manufacturing in St. Louis.

THE Brown-Desnoyers Shoe Co., of St. Louis, have just closed arrangements by which their entire building will be consolidated in the great building recently completed, southeast corner of Eleventh Street and Washington Avenue. This building has a frontage of 90 feet on Washington Avenue and extends back the entire space on Eleventh Street to St. Charles. The building is seven stories high, with high basement containing over 108,000 square feet of floor space, or two and one-half acres, each floor containing one-third of an acre. The building will be divided as follows: The fifth, sixth and seventh floors will contain factory No. 1 (Ladies, Misses and Children's shoes), capacity 3600 pairs per day. The fourth floor will be occupied by factory No. 2 (Men's "Home" Goods), capacity 800 pairs per day. The rubber department will occupy the entire basement, where will be carried the largest stock of rubber boots and shoes in the West.

The first, second and third floors will be used for offices and warerooms. The building is a fireproof structure, fitted with steam heat, electric light, four elevators and all modern conveniences, making it the largest and finest boot and shoe building in the United States, and it is the intention of the company to make it a model concern in all respects.

Shoe dealers from all parts of the West and South will be invited to visit these mammoth shoe manufacturing works, and witness the process of shoe making by the latest improved machinery. Brown-Desnoyers Shoe Company are the pioneers in shoe manufacturing in St. Louis, being the first successful manufacturers there.

Rubber Horseshoes Shipped to Europe.

A RECENT visitor in St. Louis, says the *Democrat* of that city, was an English gentleman interested largely in London tramways. Remarking upon the large number of superb looking horses seen on the streets, and especially those in the service of the leading express companies, he said:

"I do not understand how it is that an inferior city like St. Louis can show the best shod hoofs in the world."

He was told that much of what he wondered at was the result of the growing use of rubber horseshoes. So pleased was he with the apparent advantages to be derived from their use that he at once ordered a carload of these shoes in assorted sizes to be shipped to the Old World. That carload goes upon record as the first shipment to England of rubber horseshoes from the firm of Edward Butler & Son, of St. Louis.

The Editor's "Mournful Case."

THE mournful case of our esteemed contemporary, THE INDIA RUBBER WORLD, sets at rest all doubt that men become imbued to a degree with the characteristics of the material they long handle or deal in. Admiring friends presented him first with a beautiful paper weight, then with a fine tail-holder (horse's), but his conscience has become so elastic from long pondering and writing on rubber topics that he asks for the horse itself. By all means give him the horse, even if made of rubber.—*St. Louis Shoe and Leather Gazette*.

Rubber Culture in the United States.

BY THE NATIONAL SECRETARY OF AGRICULTURE.

RECENT articles in this journal bearing upon the subject of the culture of rubber trees, and particularly the suggestion that it might be introduced in some part of the United States, having been sent to the Secretary of Agriculture, he has expressed his views on the subject in the following communication:

U. S. DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C., Sept. 12, 1890.

EDITOR INDIA RUBBER WORLD: I have received and read with much interest the clippings from your journal of the 15th ult. The subject of rubber cultivation in this country has had my careful attention, as I am well aware of the vast and constantly growing importance of the rubber trade, and the consequent steadily increasing consumption of the raw material which we now import. But I have grave doubts that anything valuable or desirable can be done in the manner which the clippings suggest.

The point is simply this: Is there anywhere in the United States a climate fitted for the profitable growth of rubber-producing trees? If not, no expedient that may be resorted to will meet this primary requirement. For instance, the clippings suggest that grafting renders a tender plant more hardy. Other things being equal, no such result has ever been attained. A tender plant grafted on a hardy stock is not, consequently, rendered more hardy.

The idea of getting a hybrid plant by crossing the *Hevea*, (formerly known as the *Siphonia elastica*), with a *Morus*, cannot be entertained as a possibility. The former is a strictly tropical plant, growing in the warmest parts of Central America, and especially in the valley of the Amazon. There is no similar climate in the United States.

Plants of the *Manihot Glaziovii* were procured some time ago by this Department, with the view of propagating sufficient quantity for trial in Southern Florida. Quite recently, Mr. J. G. Tucker of Santa Maria, Cameron County, Texas, informed me that he had grown "Caoutchouc trees," and had the seeds for sale; but he omitted to give me the name of the tree, so that I am ignorant whether they are of the proper variety or not. I have ordered some of the seed from him for the purpose of having them tested, but have not yet received them. It is possible that the climate of Southern Florida may eventually help in solving the problem. It may be that the climate there will prove favorable for the growth of the proper variety.

I learn from the newspapers, but from no other source, that Stanley is said to have discovered vast rubber forests in Central Africa, equal in quality to the best Pará; but no mention is made of the facilities for gathering the gum, nor of the means of transportation to market.

You may rest assured that anything within my power to do, will be done, to ascertain the possibility of acclimating the proper tree in this country. Respectfully,

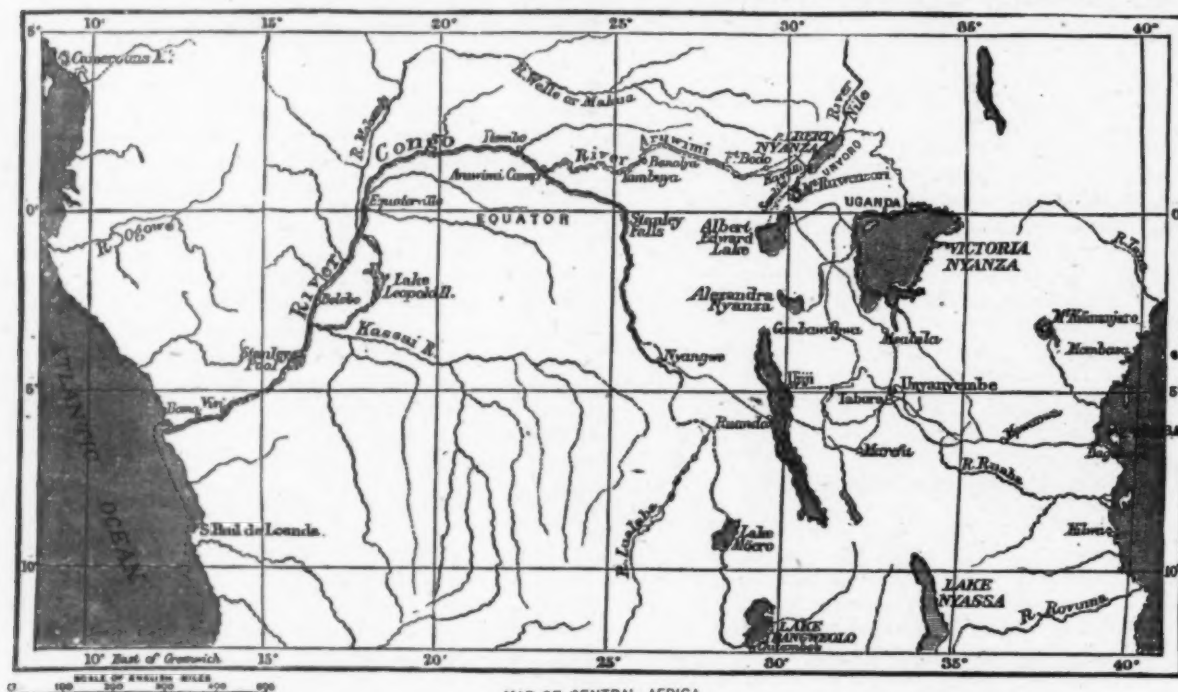
J. M. RUSK, Secretary.

The Congo Railroad.

THE above map of Central Africa, representing the geography of that section as it is understood since the latest discoveries by the explorer Henry M. Stanley, will help to give an idea of the location of the proposed road of the Congo railway. The Congo Free State, recently added to the civilized world through the enterprise of Stanley and the munificence of the King of the Belgians, developed rapidly during 1885 as a result of the impetus given to interest in that direction by the conference in Berlin in November of the preceding year. The prosperity of the great basin of Central Africa depends of course upon the outlet to the sea-board which nature has furnished in the Congo River. The Berlin Conference after many weeks of careful deliberation secured to the Congo Free State all the territory needed to provide it with uninterrupted access to the sea. The natural channel of transportation, however, is not complete, there being such serious obstacles to navigation

took part in the Berlin Conference, so that from the beginning the project would be international in character. It was intended to register the company under British laws and fix the seat of administration in London. The directors of the proposed new company submitted a copy of their charter to the Congo government, which returned it with so many amendments that the directors refused to accept it. The Congo government declared that the railroad must be subject to itself and not to British laws. The syndicate was finally dissolved and the matter was taken up by the British financiers who organized "La Compagnie du Congo, le Commerce et l'Industrie," with 1,000,000 francs capital, and asked outside subscriptions. The purpose of the company was to conduct railway and other inland transportation lines, river and sea navigation, and construct docks, bonding stores, and public works generally.

The surveys of the new railroad line from Vivi to Leopoldville averaging about thirty miles south of the Congo River had been nearly completed in the beginning of 1889. Captain Gam-



MAP OF CENTRAL AFRICA.
[FROM THE CONTEMPORARY REVIEW.]

through the Congo as to make commerce practically impossible without some artificial help. Important points to be considered on the line of the river are Stanley Pool, 800 miles from the sea, and Stanley Falls, over 1000 miles further up the river. The Congo is navigable above the upper point several thousand miles further.

In December, 1884, an agreement was concluded at Brussels for the construction of a railroad connecting the lower with the upper Congo from Leopoldville, the capital of the Congo State to a point accessible to sea-going steamers near Noki. By this means, cataracts which now cut off direct access between Stanley Pool and the sea, could be turned; merchandise from the world could be shipped to Leopoldville and there exchanged for produce collected on the thousand miles of navigable river between Stanley Pool and Stanley Falls and numerous tributaries of that river. The capital proposed is £1,000,000, for which subscriptions were to be obtained in the capitals of the fourteen powers which

bier, the director of the surveys, computed in 1889 that £1,000,000, would be enough for the construction, general expenses, and interest on capital during four years of construction, the line of road to extend over 260 miles. Since this time the work of construction has been in progress and if it should be carried out according to the programme, the world will be able within four years to utilize the new railroad line, opening the rubber fields in Central Africa which Mr. Stanley has tried so diligently to advertise.

WHITE ANCHOR FIRE HOSE "landed a winner" in the competition for the Allegheny City Fire Department last month. What decided the city fathers was a test of some which had been supplied them thirteen years ago. Though in constant use ever since it failed to show any signs of weakness under a pressure of 200 pounds, the deal was under the management of Mr. G. R. C. Johnston, agent for the B. F. Goodrich Co. in Pittsburg, Pa.

Trade Notes.

A MEETING of the Mechanical Rubber Goods Manufacturers' Association, took place at the Gilsey House, in New York, October 1. The meeting formally agreed to maintain prices, and then partook of a substantial dinner, afterwards adjourning to meet in Boston in November.

—The many friends of J. M. Plummer will be sorry to learn that he has been suffering for some time past from a hurt he received on the right hand which came very near resulting in blood poisoning. Since the middle of July this has troubled him, and it is only of late that the physicians have succeeded in beginning its cure. He is, however, back in his office and attacking work with his usual vigor and cheerfulness in spite of the manifest discomfort that his feverish right hand makes for him.

—Mr. William T. Barutio, for a number of years associated with the Boston Woven Hose Co., has accepted a position with the Chelsea Wire Fabric Rubber Co. He will have charge of their sales on the road, and as he has always been popular, will no doubt meet with the success he deserves.

—Treasurer Lothrop, of the Boston Car Spring Co., during the rainy weather in September, caught a severe cold which resulted in complete prostration for a few days. He is at last about the office again, and feeling better, but is willing to take almost any precaution that will insure him against the usual fall cold.

—The Boston Woven Hose Base Ball nine had another of their base ball battles with the crack Lovell nine, made up of employes of the Lovell Arms Co., and to their great delight succeeded in defeating them. Following the victory over the Lovells, the Woven Hose played a very exciting game with the Norwich team, and to their intense disgust, were defeated. It is claimed they had to play against a good many professional players who were hired for the occasion, which may sweeten the bitterness of their defeat a little bit, but they have got so used to victory that it is hard work for them to accept anything else with any degree of complacency.

—The Mason Regulator Co. have a very fine plant out in the town of Milton, Mass. It happened that upon their factory they had what is known as a chime whistle, which, while it is very effective in calling the hands to their daily toil, is far from being musical. This being the case, some of the old residents in Milton objected to being awakened at 7 o'clock in the morning by its shrill scream. Mr. Mason, of the Regulator Co., is a genuine inventor, and when he discovers anything that is not just what it should be, he goes to work to remedy it. He therefore set his wits to work to make a whistle that should not be troublesome. This he did in his machine shop, producing a whistle on an entirely new principle that gives forth a low, melodious note that can be heard to a great distance, and is entirely free from the shrill, strident tones that are so commonly found in the factory whistle. So pleased are the Mason Regulator Co., and indeed many others, with this new whistle, that it is probable the company will manufacture them and put them upon the market. It is said that they are of exceedingly simple construction and can be made for much less than the ordinary steam whistle.

—Many of the clothing stores are arranging their interiors for the greater accommodation of their customers in making purchases. The ware-rooms of the American Rubber Co. are being furnished with a complete outfit of new counters and racks for the display of goods. Business at the mills in Cambridgeport, Mass., is reported excellent, the works being run night and day.

—Mrs. Jenness-Miller has given the Bailey Rubber Brushes quite a boom by recommending them for physical development, and also as a genuine means of beautifying the skin. Her recommendation, by the way, is an exceedingly practical one, for it was accompanied by a large order for these goods.

—Treasurer Morrison, of the Reading Rubber Works, has purchased a fine residence in Andover, Mass. This will be very convenient to his factory at Reading, as the run from Andover to Reading is but fifteen minutes, and about the same time from Reading to Boston.

—The Standard Rubber Co. report a fire at their factory in Brockton, Mass. The fire, by the way, is rather difficult to explain, as it occurred in one of the heaters. It is possible that one of the coats might have come in contact with a steam pipe, and being pressed hard against it, and the naphtha fumes not being quite out of the cement or out of the compound, might have caught fire that way, but until some one has the faculty of watching the inside of a heater while the heat is on, no one will probably know exactly how these fires occur.

—Mr. Sloane, of the Mercer Rubber Co., has returned recently from his summer outing in the White Mountains, where he has spent several weeks building up after a hard year of work at the factory at Hamilton Square. His partner, Mr. Clancy, took his vacation in that delightful part of Massachusetts known as North Andover.

—During the recent heavy rains and damp weather, the rubber shoe factories were obliged to keep steam on the making-up and stock rooms, because the dampness was getting into the linings of the boots and shoes, and mildew was feared.

—The Mason Regulator Co., of Boston, Mass., issue a new illustrated catalogue of their specialties for steam regulating, which it will profit any steam user to send for and read.

—The Boston Woven Hose Co. have just issued a new catalogue which is very compact, neat and complete. There are in addition to the staple goods many new specialties which are fully described and illustrated.

—It is pleasant to feel that the descendants of the original rubber manufacturers are in the business that has been brought so close to them. Nathaniel Hayward had a nephew who early went into the rubber business and to-day runs seven flourishing stores. It is hardly necessary to add that his name is J. Francis Hayward, and that his main house is in Boston.

—The Reading (Mass.) Rubber Co., have received orders recently for 100,000 yards of cloth for carriages.

—Secretary W. B. Dowse, of the Metropolitan Rubber Company, Wallingford, Conn., says that, owing to the largely increased business of the company, at an early date it will erect another building which will be as large, if not larger, than the present factory.

—The Lambertville Rubber Works, in New Jersey, shut down on Saturday last for a few weeks to make necessary repairs.

—On Thursday afternoon, October 23, the new Alice mill, at Woonsocket, R. I., will be dedicated. Invitations have been sent to 350 persons, and a spread will be served by Gelb & Norton of Providence, on the third floor of the mill. Welch, of Providence, is to decorate the hall, and distinguished persons from Providence will be among the guests.

—The Boston Belting Co., a few days ago, sold about 40 tons of belting for a part of the equipment of a new elevator in Buffalo. The bill runs nearly into five figures, of dollars. A photograph of the lot stacked up would appall the Department of Encumbrances of a metropolitan city.

—Mr. George A. Eldridge, of the Wales Goodyear Co., of New York, has been on a two weeks' trip to Boston.

—A large business is expected this season in rubber tires for bicycles. Nothing but a good quality of Pará is used for this purpose. A set of tires weighs about three pounds, and sells at the rate of one dollar per pound.

—There is much disparity in reports of stocks of rubber at Pará. It seems there are four grades in that market; fine, medium, coarse and caucho. The caucho comes from Peru, and is counted in the stocks at that port, or not, according as it may suit the interest of parties there. In making comparative statements, caucho will be put in one year and omitted from another to make a statement agree more closely with the wishes of the party manipulating the report. Large banking houses are careful to avoid errors of this sort, but in the average circular, it is almost impracticable to eliminate the discrepancies.

—Mr. W. A. De Long, of De Long, Betts & Co., with his family, returned on the steamer *Ems* last month from an excursion of twelve weeks in Europe. Three months every summer, and one month every winter, devoted to recreation, keeps Mr. De Long apparently on the sunny side of forty.

—The web companies have gotten out full lines of new designs with their usual good taste and judgment. There has been during the past season a great run of blacks and lately they have been colored on one side. They are also made now so they will not crock. Stocks have gone off very rapidly and the ware-rooms of T. Martin & Bro., New York, look very bare. A good business is reported from every quarter, keeping the mills very busy.

—Stock has been subscribed and the machinery purchased for a factory at Orting, Wash., for the manufacture of rubber cloth for gossamers and overcoats.

—The Goodyear Rubber Co. report business very good, with mills in full operation.

—Mr. George B. Bushby, of the firm of Austin & Bushby, of San Francisco, visited New York a short time ago in search of new lines of rubber goods that might be good sellers on the Pacific slope. The rubber trade, he says, keeps well to the front in the new North-western States. Mr. Bushby called at this office and arranged for regular visits from THE INDIA RUBBER WORLD.

—Mr. Warner, assistant superintendent at the Wales-Good-year factory in Naugatuck, Conn., is quite ill. He had quite a siege of typhoid fever, and recovering from that, caught cold and pneumonia set in. As he has an excellent constitution, the chances are that he will recover, but it will be some time before he resumes his old position at the factory.

—The Editor of the INDIA RUBBER WORLD recently saw a sight which gladdened his eyes, which was nothing less than about 150,000 pounds of Pará rubber, hanging in long, thin strips, in the ample drying room of the India Rubber Glove Co., at Naugatuck. To-day, when rubber is worth as much as it is, one cannot look upon an amount of the finest gum like this without feeling more or less impressed by its commercial value. Aside from this, there is also, to the genuine rubber man, a feeling of pleasure in stretching and tearing and smelling of the real old fine Pará, after it has been cleansed and is hanging in the drying room.

—Mr. N. Michaels, who travels for the Commonwealth Rubber Co., of New York, has just returned from a New England trip, and cheerfully announces that business is good.

—The Johns-Pratt Manufacturing Co., of Hartford, Conn., have completed their new plant and put in several hydraulic steam presses, which are used in curing the Vulcabeston, and other rubber and asbestos compounds. These presses are made by the Holyoke Machine Co., of Holyoke, Mass., and are said to give excellent satisfaction.

—The St. Louis *Dispatch* says of a local rubber house: "No city East or West can offer better facilities to purchasers of rubber goods or show larger lines in the various kinds than St. Louis. In fact, there is no house in New York or Boston carrying as complete a stock of rubber and oiled clothing, fine Macintosh and silk waterproofs, water boots and shoes, belting, hose and packing, druggists' rubber goods, as the Day Rubber Co., of this city."

—A sole leather cutter altered for use in rubber work, has been supplied from H. Parsons' machine shop, at Marlboro, Mass., to the Woonsocket Rubber Co.

—The boilers and engines used by the New England Rubber Co., while in business at Northboro, Mass., have been sold to J. P. Wood & Co., of Marlboro.

—There is a new rubber-stamp factory at Chillicothe, Ohio, to be known as the Chillicothe Rubber Stamp Works.

—The works of the Toronto Rubber Co., at Parkdale, Ont., were damaged by fire September 16, to the extent of \$5,000, which is covered by insurance.

—The Colchester (Conn.) Rubber Co., are about to put up a new building in the office lot.

—A deal was consummated in Reading, Mass., September 24, the same being the purchase of the Chauncey Rubber Works by Charles W. Hatch, of Lawrence, and Thomas B. Black, of Reading. The Chauncey company vacated the plant about a year ago, going to Wallingford, Conn. They were employing at the time between 300 and 400 hands. It is said to be the intention of the new owners to place the plant in order immediately and carry on the same branch of business as heretofore conducted.

—The new Mackintosh factory erected by the Hodgman Rubber Co., at Mt. Vernon, N. Y., was opened October 6, with double the facilities, and number of operators contained in the old building, which was burned down in May last. The building is three stories high and 165x30 feet in size.

—The Derby (Conn.) Rubber Co. have bought the plant of the Electric Light Co., at Shelton, and are arranging to enlarge it.

—Charles A. Hoyt and others, of Brooklyn, N. Y., have incorporated the Goodyear Hard Rubber Co. at Flushing, L. I.

—The New Jersey Zinc and Iron Co. have been doing a good year's business, being pressed all the year through to fill contracts. They have refused large orders that have been tendered them in the meantime, in order to save their customers from disappointment.

—Now when the rubber trade is taking so much interest in the arrangement of stores, it will be worth while for any retailer to send for a "Short Manual on Window Dressing," which is issued by the Norwich Nickel and Brass Works, of Norwich, Conn. The pamphlet contains many valuable hints, a number of fine illustrations, and is just what one wants for information of that kind.

—Mr. W. G. Allen, the United States Consul at Kingston, Jamaica, is an earnest advocate of the establishment of trade depots—that is, a wholesale or supplying station in each of the islands of the West Indies, from which the retail demand could be more readily and cheaply supplied than by direct orders from the United States. The proof of this has been demonstrated, he says, by the establishment of a depot of this character in this consular district, the proprietors of which assure him that they are doing a thriving business, and that the demand for goods in their line (boots, shoes and rubber goods) is steadily increasing.

Para Reports Per Steamer.

PARÁ, September 1, 1890.

THE demand continuing to be very active and the supply being moderate, prices advanced rapidly to 3300/2300 reis for Islands and 3500/2500 reis for Sertao, at which latter quotations were sold 85 tons Purus arrived August 26. Nearly all buyers have shown much eagerness in obtaining rubber. Arrivals last month were 1100 tons (against 1020 tons August, 1889), whereof 45 Caucho; we think this month we shall not have more than 1200 to 1250 tons.

RUBBER STATISTICS.

		Kilograms.*
August 1. Stock on hand		291,000
" 30. Receipts this month rubber	1055,000	
" " " Caucho	45,000	1,100,000
		1,391,000
Exported.—Europe.		
August 1, per Sobralense	184,000	
18, " Anselm	193,000	377,000
United States.		
August 2, " Justin	103,000	
" 23, " Paraense	293,000	
" 26, " Advance	142,000	538,000 915,000
Stock this day		476,000
In first hands		10,000
In second hands		466,000

PARÁ, September 23, 1890.

Our market kept very firm since our last until the 13th, when, owing to exchange rising to 22½, there were only buyers at 3250/2250 reis for Island rubber. The 15th being election day, there were no transactions, and on the 16th the prices of 3200/2200 reis were opened, the rate of exchange having further risen. Owing to the news of weakness received these last days from the consuming markets, the demand has not been general at these figures, some buyers offering only 3150/2150 reis.

About 100 tons Madeira rubber arrived on the 14th and were sold at 3400/2400 reis, and 30 tons Caucho from Peru, which came in on the same date, fetched 2000 reis.

The stock of Amazon rubber to-day consist of about 115 tons Madeira and Jurua. This morning 50 tons of Jurua rubber were disposed of at 3350/2350 reis.

Exchange, after having risen to 22½, declined gradually, closing to-day at 22¾ for commercial bills.

Receipts to date amount to 1000 tons. The receipts have been larger this month than during the same period last year, owing to the fact that rubber is sent from the interior as fast as it is gathered, in consequence of the high prices which have been ruling, none being kept back, as happened in former years, when prices were low. The total probable receipts this month will show an increase of about 300 tons as compared with those of September 1889.

Bearer (steamship *Lisbonense*) carried to New York 252 tons.

RUBBER STATISTICS.

		Kilograms.*
Sept. 1. Stock on hand		476,000
" 23. Receipts to date: Rubber	965,000	
" " " Caucho	35,000	1,000,000
		1,476,000
Exported.—Europe.		
Sept. 2. Mananense	281,000	
17. Lanfranc	36,000	419,000
United States.		
Sept. 1. Clement	94,000	
" 10. Augustine	228,000	
" 16. Finance	112,000	
" 23. Lisbonense	232,000	716,000 1,135,000
Stock this day		341,000
In first hands	188,000	
In second hands	153,000	341,000

*Kilogram—2.20 pounds.

J. VIANNA & Co.

A Help in Dry Heat Vulcanizing.

MESSRS. HOHMANN & MAURER, the successful and reliable fine-instrument makers, who are ever observant of the wants and requirements of rubber manufacturers, are now making a thermometer for Dry Heat Vulcanizing, as shown in cuts herewith, the essential features of which are as follows:



The tube, instead of being of white, is made of black enameled glass, which gives a greater brilliancy to the mercury and can therefore be seen and read more easily, especially so at night or in dark places, where mercury against a white backing could not be seen. The figures are large and the graduations heavy and open, as shown in cut, and the thermometer itself very accurate. The rings on these cases are not soldered on, but made of heavy wire, strongly riveted and cannot break off, and the black filling in the numbers and lines will not wear out.

This thermometer will be found to greatly facilitate the readings of temperature of the Dry Heater and the makers will cheerfully send lots of half dozen for inspection and test.

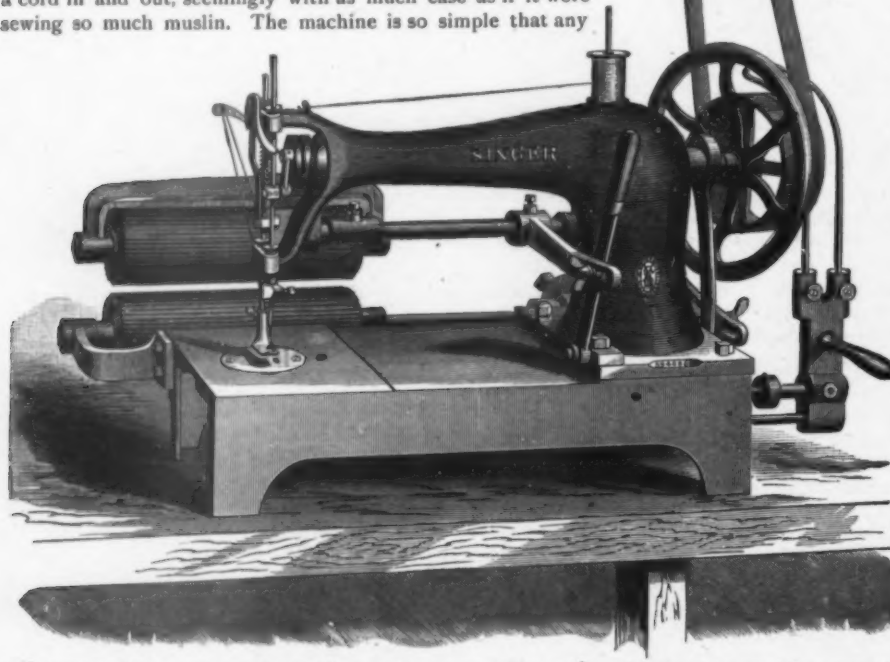
The Metropolitan Co.'s Boston Store.

THE Metropolitan Rubber Co. for a long time have had an office in Boston, Mass., but the business has shown a growth that cannot be mistaken, and they now have leased a large store in the new building, No. 47 Summer Street. The store, which consists of the first floor, and a sub-basement, is 22x1100 feet, well lighted, and will be elegantly fitted up and everything done to make it a model rubber store of the country. It will be well lighted of evenings, and whenever necessary, by incandescent lights. Mr. E. E. Leach, formerly with the American Rubber Co., but who for the past year has been associated with the Metropolitan, will have charge of the store, together with all the interests of the company in Boston.

LITHARGE, which is much used by rubber manufacturers, is just now a little slow of sale, the demand being dependent largely upon the needs of the trade. Prices fluctuate with more or less rapidity in consonance with lead, but there has just been an advance, as noted elsewhere. The largest mills use so much as three hundred tons annually in their manufacture, and smaller concerns amounts varying with their capacity. Litharge is the product of the direct oxidation of lead. The carbonate or white lead is burned, when it assumes a flaky form, which is ground to a fine powder. Necessarily it is pure, but can be tested by taking a small quantity, burning it and bringing it back to the blue metal. It has other uses, of course, than in the manufacture of rubber, and which make a steady demand for it during the whole year. The Atlantic White Lead and Linseed Oil Company, of New York, is one of the chief sources of supply to rubber men.

A Giant Among Sewing Machines.

HOW to increase the strength and efficiency of a belt and at the same time keep it of the proper weight, has been a problem that has engaged many thoughtful minds. Of late years a very acceptable improvement has been the stitching of the belt after it has been made up and cured. At first thought this would seem to be a difficult feat, for the belting with its many plies and toughened combination of duck and rubber could not be else than a troublesome article to puncture once, let alone the thousands of strokes necessary to a series of stitches throughout its length. After careful study by their brightest mechanics, however, a company who own the largest and most complete plants in the world for stitching machines, succeeded in making one for sewing belting which is a success. It is a solid, durable looking affair, a veritable giant beside the ordinary sewing machine. A needle that will pierce through any thickness of duck and rubber, carries a thread that is almost a cord in and out, seemingly with as much ease as if it were sewing so much muslin. The machine is so simple that any



ordinary workman can run it, and has such a range that any length or width of belting may be stitched with it. Any manufacturer wishing to examine one of them, can see it in actual use at the manufacturers show rooms of the Singer Sewing Machine Co., No. 385 Broadway, New York.

Rubber Artificial Limbs.

INDIA RUBBER in the prosthetic art has been a great boon to mankind. The man compelled to use artificial limbs in the infancy of the art was obliged to content himself with hinges, cords and suspenders, which by manipulation produced the joint action. These creaked and thumped, and to avoid these disagreeable features the rubber foot and hand were invented. The body of these substitutes is composed of sponge rubber, a peculiar vulcanization, made only by one or two manufacturers. This rubber is formed in different degrees of flexibility, and acts more or less like dough in a pan, save that it returns to its original form when the weight of the body or pressure is withdrawn. It is the only substance that imitates the ankle

action of the human foot. Rubber hands are made as perfectly that many cripples are able to write, which really is an easy thing to do, compared with other feats performed by the unfortunates. Crutches are made with rubber tips, and the gum is used in various ways, too numerous to mention. A truckman in the employ of the New York Belting and Packing Co. has used a rubber foot for many years. The patents for these artificial limbs are owned by A. A. Marks, the well-known Broadway manufacturer, in New York.

The Father of the St. John's Exhibition.

THE St. John's (N. B.) *Progress*, in a lengthy review of the Exposition now in progress in that city, gives credit to Mr. James A. Estey, of the firm of Estey & Co., who are prominent in the rubber trade in the Provinces, with being the "Father of the Show." One of the features of the Exposition which has proved a great attraction is the display organized by the Natural History and Geology Committee of which Mr. Estey is the chairman.

"Chairman Estey's chief connection with the exhibition, however," says the *Progress*, "dates back further than the geology and natural history committee. He can fairly claim the honor of having originated the idea of an Exhibition Association and of moving the first resolution in connection with it. Every movement must have a start and Mr. Estey gave the start of this.

"The idea was not original with him, but the onus of collecting information and data to back up his motion fell upon him and the first reliable information the citizens had of any such an association else-

where and its workings was given by Mr. Estey at a meeting of citizens the mayor's office in the fall of 1888, two years ago."

GEORGE C. BARTLETT & Co., of New York, are meeting with much success with "Snap" collars and cuffs. They are made of pure Zylonite, hardly distinguishable in appearance from the finest linen, and have attached to them a button, neat in its design, which is the fastening. This button will not move in the buttonhole, and, therefore, will not rattle every time one wishes to shake hands with a friend who has not yet learned to like celluloid collars and cuffs. Another advantage is that the buttonhole does not become soiled, or break. The Messrs. Bartlett have named the different brands of these collars and cuffs for different distinguished personages, Gladstone, Dana, Depew, Edison, Newton and Wanamaker. The ladies' cuffs are named for Mrs. Cleveland. By the way, few people realize the great number of celluloid or Zylonite collars worn. The imitation is now perfect, and one cannot test them, as is generally supposed, by touching them with a lighted cigar or match. Linen burns more freely than they do.

The New Duties on Rubber Goods.

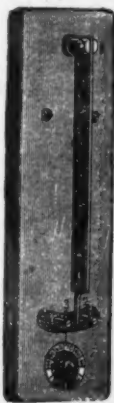
SOME very active work by rubber men was done at Washington during the past summer. In the manufacture of rubber clothing it has been a very difficult matter to compete with the importations of moderate priced mackintoshes which are continually coming into the country. The sale of the higher priced garments has not been sufficient to economically keep the factories in occupation, and this competition has always been a serious matter. An association of the rubber clothing manufacturers was formed six or eight months ago, principally for the purpose of an affiliation in social and general matters, but from this organization a committee was selected consisting of C. A. Place, of the Metropolitan Rubber Co.; Mr. Apsley, of the Goodyear Co.; Mr. Cable, of the Cable Rubber Co. and Mr. Church, of J. Galt Smith & Co. These parties were instrumental in having the House Committee on Ways and Means propose higher duties upon rubber garments. It was omitted by the Senate Finance Committee but afterward in the Conference Committee as follows:

On cotton rubber goods the old duty was 30 per cent. *ad valorem*, which was changed to 50 per cent. and 50 cents per pound; on woollen mackintoshes it was 40 per cent. and 35 cents per pound—now it is 60 per cent. and 49½ cents per pound, and on silk goods, it was 50 per cent. and now it is 60 per cent. and 128 cents per pound. This protection is ample to insure the manufacture of all garments in this country, and it is believed that prices can be maintained at a very moderate advance, which the competition of domestic manufacturers will regulate.

The point made is that if the Association had not happened to meet with the accident of existing—an Hibernianism which expresses the situation—this protection would never had been obtained, and it emphasizes the suggestion already made in two or three quarters that an association of rubber men should be formed for literary, social and business purposes.

Regulation of Heat for Rubber Men.

RUBBER MANUFACTURERS are all great heat users. For drying, grinding, calendering and curing heat is used, and unless properly used is many times wasted. In vulcanization particularly the lack of regulation for the heat has cost many thousands of dollars. The time has come, however, when science is getting the control of this part of manufacturing as well as of so many others. In the accompanying illustration we see the thermostat as it is applied to vulcanizers, and drying rooms, where by a simple electrical device it raises a "heat" slowly to a desired point and holds it there without variation until the cure is finished. The apparatus is so simple that any one can make use of it, and it can be applied to any sort of heating or curing device. Manufactured by the New England Fire and Heat Regulator Co., No. 65 Federal Street, Boston, Mass.



A NEW insulator for telegraph lines is made of a coil of rubber nine inches in length, and of so slight a form as to be hardly discernible when placed in position. The protection inside the rubber is of such character as to be able to endure any strain to which it is liable, even to holding the end of a line.

The Rubber Market.

NEW YORK, October 13, 1890.

THE rubber market is in an unsettled state, with important conditions evenly balanced. About the first of the month offerings were made, it is said by large holders, at about 83 cents for fine Pará, but the transactions were very limited, and it is a question whether any sale was made at the minimum figures. Many reasons are given for this drop. By some it is stated that as this is the season for large arrivals, the holders do not care to maintain the price at high figures, which would invite the whole world to market its holdings in this country. The financial conditions also are somewhat strained, and it has been with difficulty that rubber paper has been carried. This is not exceptional, for railway shares have experienced a severe decline, and the London money market has been in a state bordering on a panic for the past few days. Manufacturers are buying only to satisfy immediate wants, and for the moment there is a dearth of transactions. Manufacturers are, however, disposed to look upon the situation with a great deal of equanimity, as the margin of profit, if any, has been very small, and there has been a fear that further advances in products would restrict consumption, and it would seem as though they would become necessary if rubber maintained itself at the figures asked for it a month ago. Some of the sales at low figures were for rubber to arrive, which, of course, would account for a portion of the reduction.

The conditions of the consumers of rubber differ a little at this time of year from that of last year; last year the prices of rubber were about 20 per cent. lower, and the manufacturers had larger stocks on hand. It is estimated that the deliveries of Pará rubber to manufacturers between May 1 and October 1, 1889, were 1500 tons more than the same time this year.

The situation briefly summed up is that there are no large stocks in the market, and while holders may be anxious, the statistical position viewed in the light of former years, is strong, and should buyers come in for any good sized quantity, the market would doubtless respond very quickly and prices appreciate rapidly. Centrals and Africans are in good supply at the moment. Few sales have been made at comparatively lower figures.

The arrivals at New York have been from Pará:

Steamer <i>Clement</i> , Sept. 20	194,000 lbs.
" <i>Augustine</i> , Sept. 23	536,000 "
" <i>Finance</i> , Sept. 29	230,000 "
" <i>Lisbonense</i> , Oct. 4	519,000 "

Much of this rubber was sold to arrive. The stocks in New York are not well known enough to be accurately compiled.

The arrivals at Pará during August, were 1100 tons, against 1010 for the same time last year, and for September, 1420 tons against 1150 last year. For the first week in October they were 250 tons. This increase of the crop caused a falling off of prices from 3200 reis for Islands to 2900 reis, but at this lower price there was such an active demand started for rubber that the price reacted to 2050 reis. Exchange, 22¼d.

The mail from Pará brings news that large purchases were attempted at an equivalent of about 85 cents for Upriver fine Pará landed in New York, and one large syndicate tried to secure a contract of 500 or 600 tons per month for the months of September, October and November, of Upriver rubber on the basis of 85 cents landed in New York, but the receivers refused to entertain such a heavy business at this price.

The same mail informs that the large receipts at the beginning of the crop were due to the extra hurry of getting the rubber to the market; instead of waiting for the river steamers to

Prime Lagos Palm Oil.....	per lb.	64.07
Prime White Barytes.....	per ton	\$70.22.50
American Refined Barytes.....	per ton	20.
American No. 1.....	per ton	18.
American No. 2.....	per ton	16.
American off-color.....	per ton	13.15.



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Free Want Department.

WANTED—A young man to travel through Ohio, Pennsylvania and New York. Must thoroughly understand and be posted in Mechanical Rubber Goods and Fire Department Supplies. Must be able to give good references as regards ability, habits, etc. Also state salary expected. Address "D," INDIA RUBBER WORLD.

WANTED—Foreman or Supt., to take charge of shop employing 30 men. Must thoroughly understand and be able to produce economically all kinds of moulded work. Give age, experience and salary desired. Address F. W. M., 44 North Ada St., Chicago, Ill.

WANTED—First-class travelling men of experience, thoroughly acquainted with the rubber business in all its varieties, including mechanical goods; clothing, both oiled and rubber; druggists' and stationers' sundries. Address OMAHA RUBBER CO., 1008 Farnam Street, Omaha, Neb.

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WANTED—A good hose maker. One who is generally posted on general matters in mechanical rubber goods. Must be a sober man and one not afraid to work. Address A. A. INDIA RUBBER WORLD OFFICE.

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WANTED—By a man with twelve years experience, a position as superintendent of factory, making either rubber clothing or carriage cloth. Address S. A. M. INDIA RUBBER WORLD.

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